PASSENGERS, PACKAGES, AND COPPER: THE STEAMER *PEWABIC*, ITS ARCHAEOLOGY, MANAGEMENT, MATERIAL CULTURE, AND THE DEVELOPMENT OF THE KEWEENAW PENINSULA

by

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Pewabic was a passenger/package freight propeller with multiple identities that will serve in this study to better understand the tourism explosion and the copper boom of the Great Lakes during the Civil War. The hybrid steamer brought urbanites to the vast forests of Lake Superior upbound while filling its hold with 250 tons of native copper to sell on the Detroit mineral market downbound. *Pewabic* represents the essence of the middle nineteenth century Great Lakes economic and cultural zeitgeist having tapped into two profitable enterprises. The primary goal is to place the short-lived *Pewabic* into the larger context of Great Lakes commerce and tourism by researching its economic role during the Keweenaw copper boom and its therapeutic role for war-torn Americans. Documentary historical sources and archaeological data will be used to unearth the identities of *Pewabic* afloat as well as the new identities it has adopted as an archaeological site, a gravesite, and salvage training ground.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: INTRODUCTION

Lake Superior has always been a place of opposites: wilderness and industry, peaceful summers and ruthless winters, comfort and survival. Unparalleled caches of copper and iron ore lured the bold to domesticate Superior, but the region's isolation made settlement and growth extremely difficult:

> The shores, clad in perpetual verdure, rising upon the vision and receding in the distance, stir up the mind with their grandeur and mellow it with their beauty, creating an intense harmony that may be felt and enjoyed but cannot be described. There was the wildness of nature as it presents its rugged front as a barrier to the footsteps of all, conquering the art, and there too was the foothold art had made from which to take up her march… And now, when we know the richness, the fertility, the beauty, the hidden and the exposed wealth of the great Western and North-western country that is and must ever be tributary to this lake, we are more sanguine than ever of the growth of the new towns of Lake Superior (Bayfield 1858:14).

Before the 1840s, the largest freshwater lake on the planet was an untapped wilderness of vast shores, fisheries, forests and mineral deposits. But Superior was no secret. Archaeological surveys of the Keweenaw Peninsula uncovered evidence of prehistoric humans mining copper as early as 1400 B.C.E (Thurner 1994:23). The 1840s brought the region to legislature as a prospective northern settlement with significant economic potential. Michigan State Geologist Douglas Houghton surveyed the vast mineral deposits in the Upper Peninsula and began the copper boom. Twenty years later, in 1861, the Keweenaw Peninsula accounted for 86 to 90 percent of America's copper (Lankton 2010:18).

Immigrant workers from Ireland, England, Germany, and Canada flooded into the region to work alongside Michiganders, New Yorkers, Vermonters and other Americans from every

demographic (Frimodig 1990:6, Mason 1991:61). A July 21, 1845 article from the *Democratic Detroit Free Press* reports that among the influx were "many distinguished men – ex-Governors, ex-Senators, ex-Secretaries, together with millionaires are all making a grand dash at the newly discovered copper region" (Krause 1992:143). The consequent microcosm yielded cultural obstacles of communication and mutual understanding on every front. One such example comes from the journal of a Clifton schoolteacher, Henry Hobart. Henry Hobart represents another group of people that flocked to the Keweenaw: everyone else. School teachers, store owners, wives, children, Native Americans and clerks all contributed to the development of the Keweenaw copper boom in different ways.

These people were necessary support for the social and material institutions required to sustain the boomtowns of the Keweenaw (Figure 1).

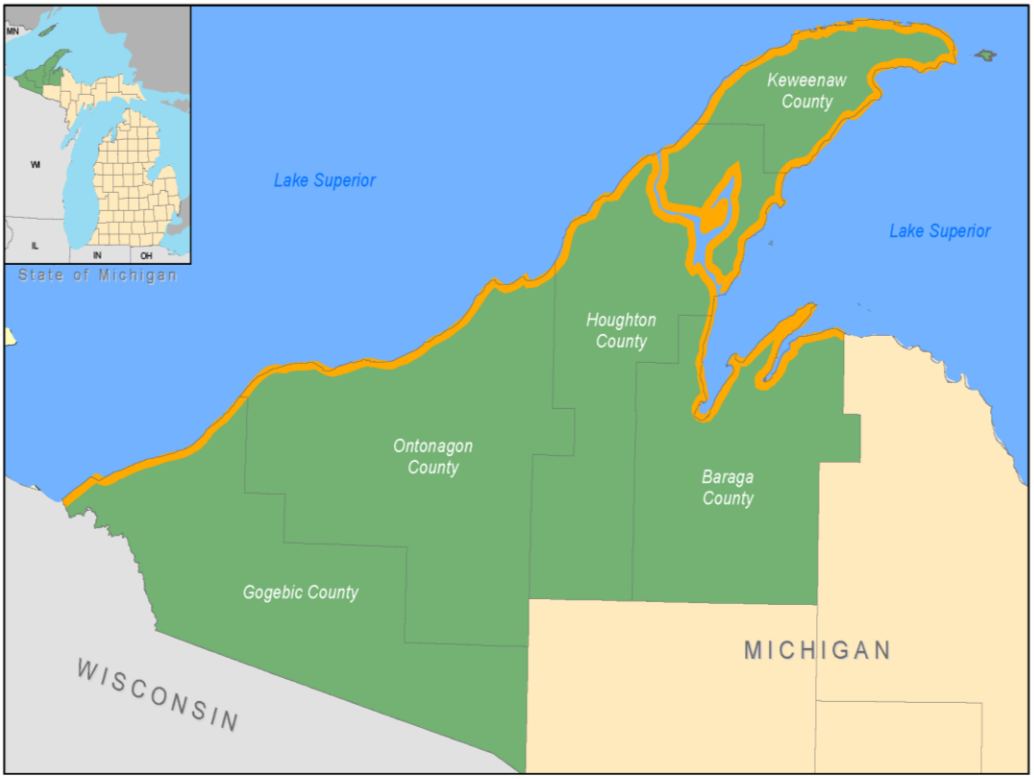


FIGURE 1. Map of the Keweenaw Peninsula. (Courtesy of WUPPDR, Houghton, MI.)

While the miners were the first group to arrive in the 1840s, their families quickly followed suit. The copper fever of the Keweenaw was not only raging among local inhabitants and invested parties, but infected the contemporary middle and upper classes of established cities like Detroit, Chicago, and Buffalo. During the 1850s and 1860s the Upper Peninsula was still native, wild and intriguing to those raised in urban cities. Since railroads had not yet been built in Michigan, lake travel was the only way for urbanites to view the spectacle of the Great White North. Central to the development of the Keweenaw was the completion of the locks at Sault St. Marie. Steamship companies were among the locks' most loyal supporters and helped finance the project through its completion in 1856. Steamer cruise tourism was gaining popularity as side-wheelers and propellers were launched from shipyards in Toledo, Bay City and Cleveland. One such vessel, *Pewabic* of the JT Whiting Line, profited from both the Keweenaw copper boom and the rising interest in lake tourism.

Pewabic is part of a larger landscape that stretches from the Keweenaw boomtowns of Quincy, Hancock, and Houghton down to the bustling docks of Detroit. Great Lakes passenger/package freight propellers were vessels in every sense of the word, acting as physical, ideological, cultural, and economical connections between urban America and the Great White North.

Research Questions

In 1865 *Pewabic* was built to serve its utilitarian purposes with ample package freight space below deck and beautiful staterooms constructed above to house the new wave of eco-tourists. At two hundred feet long with a twelve foot draft, *Pewabic*'s internal support came from

a hidden truss, a centerline arch that was hidden from public view that provided stem-to-stern rigidity above decks (Figure 2). The wooden hull was just two years old in 1865 when it struck another propeller from the JT Whiting line, *Meteor*, and sank with 1,000 tons of Keweenaw copper and between 30 and 125 lives. Even as a gravesite, *Pewabic* did not rest as it became a testing arena for new diving and salvage equipment. Because of its depth of 165 feet, relatively few archaeological studies have been attempted compared to the various salvage expeditions that began almost as soon as *Pewabic* touched lake bottom.

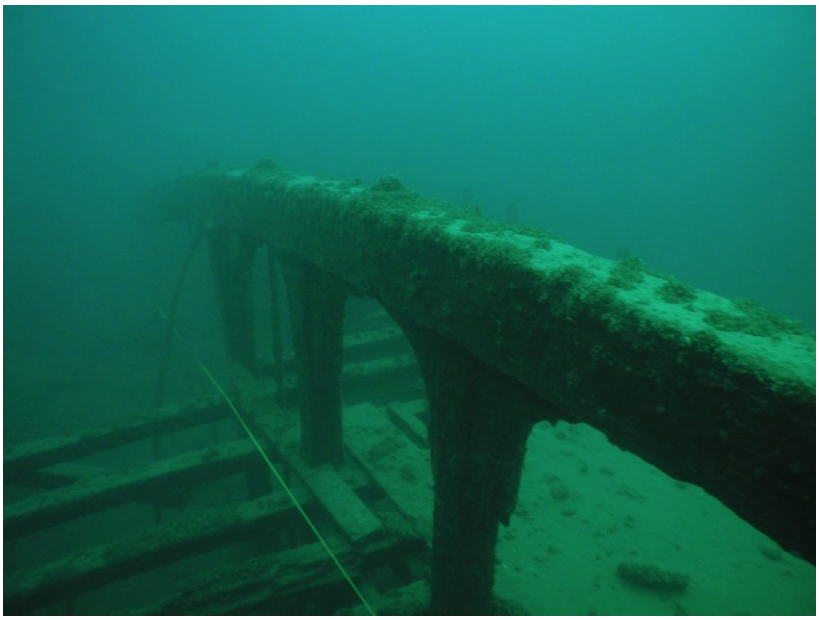


FIGURE 2. *Pewabic*'s centerline arch. (Courtesy of NOAA's Maritime Heritage Program, 2005).

Nonetheless, historical information and early salvage reports on the twin screw have survived that can be studied in tandem with terrestrial sites and documentary sources from the Keweenaw to advance our understanding of the cultural, economic and social attitudes

surrounding the 19th century Michigan copper boom and passenger industries. From these sources this thesis will answer the following questions:

- What role did steamships, like *Pewabic*, play in the copper business and development of the Keweenaw during the American Civil War?
- How does *Pewabic* reflect the relationship between the copper boom and the passenger trade? What were the connections between the two industries?

This thesis will answer these questions and explain the tragic wrecking of *Pewabic* within the larger economic and social interactions between the Keweenaw Peninsula and early eco-tourism industry of the middle 19th century.

Thesis Structure

Despite its prominence in local lore and its standing as Lake Huron's worst maritime disaster, relatively little has been written on *Pewabic*. What has been written falls into the following categories: post-collision news articles, salvage reports, and historical fiction. *Pewabic*'s role as a frequent training ground for new salvage equipment has left historians and archaeologists extensive salvage records. While it is inappropriate to classify these as archaeological material, or even truth, they command attention from an observational standpoint. Because of its depth *Pewabic* remained untouched by maritime archaeologists until recent decades.

Pewabic was more than a passenger/package freight propeller. It reflects innovations in technology, business enterprise, and recreation that characterize America during the trying years of the Civil War. *Pewabic* granted economic access to the untapped mineral cache of the

Keweenaw while providing means for war-torn Americans to rebound, refresh, and restore Northern vitality.

Extensive primary and secondary sources on the Keweenaw copper peninsula provide important context to understand the economic climate of the Great Lakes region in the middle 19th Century. Despite the plethora of available information, historians have paid little attention to the Keweenaw copper boom for different reasons. Foremost is that the copper "was taken from the upper Midwest, not from the real 'West', and it was not taken from mountains but from near the shore of a lake" (Lankton 1991:8). Most books on the Keweenaw copper boom include comparisons between Lake Superior in the middle 1840s and the Sierra Nevada Mountains in 1849. Lankton (1991:24) proposes that the reason for Keweenaw's relative projected insignificance to the California Gold Rush is Lake Superior is not as attractive a frontier. With exception the robust, lawless picture of the wild West was not a part of the Upper Peninsula's identity. Yet the copper mines directed the development of the peninsula: "the mill superintendent of one industry town is also the school superintendent and township supervisor, it follows that the folks he serves probably have little voice in the usual community affairs" (Frimodig 1990:7). Rodgers (1996:96) describes this situation as "typical boomtown conditions", lawlessness, heavy drinking, and bar room fights reserved mostly for Saturday nights after payday.

Nonetheless the Keweenaw copper boom usually maintained a quietly productive role in the Great Lakes economy, which can be seen through the dozens of records from the early companies like the Quincy Mining Company and the Calumet and Hecla Consolidated Copper Company (Benedict 1952:3; Lankton 1991:78). An employee of Calumet and Hecla who worked in the mines for fifteen years has published the accounts of the latter (Benedict 1952).

Frimodig's work, among others, is an excellence source with biographical information on several representational immigrant miners from Finland, Cornwall, and France. Early immigrant workers shaped Keweenaw culture. One example comes from a miner's wife: "With favorite flower seeds sewn into the hem of her skirt and favorite pasty, saffron and seedy bun recipes tucked safely in her memory, 'Cousin Jenny' joined her miner in Central or Clifton and proceeded to make a permanent imprint on Keweenaw's mining communities" (Frimodig 1990:6). Cousin Jenny, who is historically revered as the woman who introduced the iconic Upper Peninsula meal of "pasty", more than likely traveled to the region via propellers like *Pewabic*. Similar to pot-pies, pasties combined vegetables and beef within a thick pastry shell that Cornish miners brought with them into the mines (Lockwood and Lockwood 1999:22)

The region's remote location demanded a consistent stream of vessels to export the metal and transport workers, families, and later, tourists. It is evident from an article published in the Congressional Serial Set that early explorers in 1843 could only access the remote region via birch bark canoe or Mackinac boat from Sault St. Marie. This important document contains commerce records for lake bulk cargo trade, tables that break down ship types on the lakes, and regional records of profits listed by city between 1860 and 1890 as well as a history of early Lake Superior navigation written by JT Whiting (US House of Representatives 1892). The passenger trade was an important business venture for JT Whiting on all of seven of his steamers and supplemented his copper profits.

The Civil War had just ended and a steamer cruise was an appropriate avenue for subconscious reflection and distraction from the war's presence in the major industrial cities of Cleveland and Detroit. Additional primary sources on tourism come from various tourist

publications. Steamer and railroad companies to attract business published many of these pamphlets to attract business.

Social dialogues subjected on the draw to Superior can be found in journals of explorers and tourists (see Carter and Rankin 1970). These primary sources can be effectively used in tandem with the steam company publications to grasp the attitudes and reasons for the simultaneous booms in eco-tourism and the Keweenaw copper trade. *Pewabic*, among other passenger/package freight hybrid carriers, is what couples these distinct industries. The remains of *Pewabic* reflect its multiple identities as copper ingots lay beside steamer trunks that once harnessed the excitement and fervor of those lucky passengers up bound for the wild Keweenaw Peninsula (Figure 3). Chapter Two will detail the histories of these seemingly independent industries.

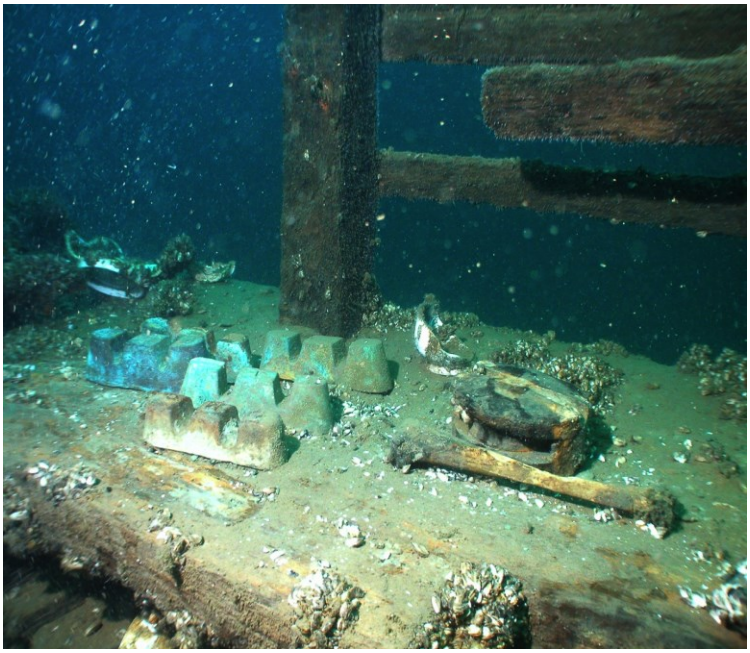


FIGURE 3. Copper ingots and human remains on deck. (Photo by NOAA's Maritime Heritage Program, 2005.)

Chapter Three introduces the vernacular craft that was built to facilitate the industries detailed in Chapter Two: passenger/package freight propellers. As the title implies, the archaeological study of this vernacular vessel craft will be approached through one of the most famous examples, *Pewabic*. Emphasis is placed on *Pewabic*'s structural features that granted *Pewabic* the capacity to transport both passengers and package freight. Several other vessels are included that exemplify passenger/package freight propellers' general characteristics and to emphasize *Pewabic*'s unique features from the other examples.

Chapter Four concerns *Pewabic*'s management history from 1865 to the present. Salvagers, on the other hand, began visiting the site beginning in the fall after its August 9, 1865 sinking date. Due to its valuable copper cargo, *Pewabic* was visited by salvagers beginning in the fall of 1865. One can imagine the execution of primitive 1865 dive technology at 165 feet, and those experiences have been recorded. News articles suggest that eight people died trying to loot the "Lake Huron's Death Ship" (Michaels 2011:1).

To add to the mystery of the ship and its salvage history, the legal rights to Great Lakes ships belonged to the owner of the vessel until he/she relinquished ownership to the U.S. Corps of Engineers, making all salvaging attempts illegal. The two most notable expeditions to *Pewabic* were in 1917, by an inventor named B.F. Leavitt and the other in 1973 by Busch Oceanographic Equipment Company (Busch 1975:59). These salvage reports from 1865-1973 provide an interesting history of site formation process. Descriptions of dynamite and clam bucket use yields important information on *Pewabic*'s current status, with the bow section blown out while the rest of the twin screw is well preserved.

While the salvage reports can be used to discern *Pewabic*'s site formation process throughout the nineteenth and twentieth centuries, historic news articles provide information on

the collision and the post-collision judicial proceedings. Articles from the *Duluth Daily News*, *Chicago Inter-Ocean*, *Duluth Weekly Herald*, *New York Times* and other local newspapers contain information about the collision, salvage attempts, and estimations on loss of life. The manifest of *Pewabic* has evaded historians and death estimates have been produced from these articles, which range from 30 to 125 persons (*New York Times* 11 August 1865).

After a discussion of the salvage expeditions and technology used, Chapter Four will detail legislative initiatives at the state and federal levels designed to protect *Pewabic* and project its cultural importance to regional maritime heritage.

Despite their copper focus, the salvage expeditions detailed in Chapter Four brought up tons of material culture including personal effects of passengers, hull remains, and pieces of cargo. At the time of early salvage expeditions, local residents were permitted to buy or take these items from salvagers, as they had no monetary value. Though troubling to the archaeologist, the consequent diaspora of *Pewabic* material culture cemented *Pewabic* as a local legend. Many of these artifacts have been reused and crafted into pieces of shipwreck kitsch. Chapter Four analyzes these artifacts to deduce *Pewabic*'s importance to local community.

Chapter Four also details the two *Pewabic* artifact collections that are housed in the Besser Museum and the Michigan Office for Maritime Archaeology housed at the Thunder Bay National Marine Sanctuary. These two institutions are the prime depositories of *Pewabic* material culture that have grown from donations by salvagers and private collectors. This chapter will analyze these collections and important representative pieces.

CHAPTER TWO: THE HISTORIES OF THE INDUSTRIES IT FACILITATED

Introduction

In order to demonstrate the value of *Pewabic* to the development of the Keweenaw Peninsula, it is necessary to understand the difficulties of reaching such a place:

> The Keweenaw was not on any frontier line. It was not on the boundary between wilderness and civilization; it was *beyond the boundary*. It was a node of settlement surrounded by wilderness and water and, because of cold, icy winters, locked out from the world below for nearly half a year at a time (Lankton 1999:20).

Before 1855, Lake Superior-bound voyagers had to debark south of the rapids at Sault Ste. Marie, continue one mile overland, and board one of the few vessels that plied Lake Superior. While this tedious process crippled commercial mining operations before 1855, venture capitalists and upstart geologists flooded the region after Michigan State Geologist Douglass Houghton released his famous report in 1841. To regulate mining permits and facilitate overland crossings around the portage, President Polk appointed Sheldon McKnight as Mineral Agent in 1845 (Williams 1990s). McKnight was the only agent who transferred cargo around the rapids. In the beginning, McKnight handled all article transfers with one horse-drawn cart, but business rapidly increased as more mines opened. In the late 1840s McKnight built more warehouses to stage packaged goods for overland portage, and employed more horse teams to traffic them around the rapids. In 1847 McKnight expanded his business with the purchase of the schooner *Meteor* to traffic goods between Detroit and his docks at Sault Ste. Marie (Williams 1990s). *Meteor* was the first vessel of McKnight's Lake Superior Line.

McKnight employed John Tallman Whiting to help manage the expanding business. Whiting helped update McKnight's operation with the construction of a one-mile railroad around

the rapids. The railroad was completed in 1851 and transported 12,600 tons of freight in the same year (Williams 1990s). Shortly after, all of McKnight's horse carts were replaced with rolling stock (Mansfield 1899:200)

While the railroad was an obvious improvement over the horse-drawn carts, McKnight could not satisfy the demand created by the Keweenaw Copper Boom. Their business grew to 100,000 barrels of package freight per year (Havighurst 1942:162). However, as mentioned, the overland portage greatly increased the time and expense required to move copper product to eastern markets in the early 1850s. It took between twenty and twenty five days for product to reach the smelters in Boston (Gates 1951:4). The words of Thurlow Weed, passenger on board the passenger steamer *Empire*, echo the need for a marine passage:

> There is nothing at the Sault which strikes a visitor so forcibly as the fact that our Government has neglected to construct a ship-canal around these rapids, connecting the waters of the mighty Superior with those of the lower lakes… Large quantities of copper, some in masses and some in barrels, lay upon the wharves here, I observed much virgin copper blocked out from the mines in pieces weighing from one to two thousand pounds (Hall et al. 1882).

In 1852, the federal government finally donated 750,000 acres, construction resources, and construction began immediately (Shaw 1990:147). As engineers and surveyors flooded Sault Ste. Marie, Whiting and McKnight made certain they had seats at the table. Whiting was soon appointed agent of the Saint Mary's Falls Ship Canal Company, the name of the corporate body that managed the canal's construction (Saint Mary's Falls Ship Canal Company 1863:1). Meanwhile, McKnight acquired steamboats to concrete his merchant marine monopoly in preparation for the opening of the canal in 1855 (Mansfield 1899:286). By summer of that year, McKnight controlled all steam-powered vessels on Lake Superior, except four (*Julia Palmer*,

Traveler, *Sam Ward*, *Manhattan*). Sheldon McKnight died five years later and Whiting became sole proprietor of their company, which was rechartered as JT Whiting & Company (Williams 1990s).

By 1864, Whiting operated seven boats between Lake Superior and the lower lakes and controlled two thirds of maritime trade on Lake Superior. The fleet consisted of one sidewheeler *Illinois* (the first boat to enter the locks in 1855) and six propellers: *Meteor*, *Pewabic*, *Detroit*, *Mineral Rock*, *General Taylor*, and *Skylark* (Croneweth 1897b). The propellers slender profile and elongated length-to-beam ratio made them ideal for passage through the locks at Sault Ste. Marie.

Pewabic and *Meteor* were the flagships of Whiting's Pioneer Lake Superior Line. These elegant passenger/package freight propellers were utilitarian tramps that filled freight contracts from livestock to leather, and everything in between. They also brought a variety of people on their weekly trips to Copper Country. First class passengers enjoyed a luxurious vacation in the cabins and saloons built on the weather deck. Beneath them lay the steerage passengers, sprawled across the dimly lit main deck. These different interests, both human and material, all had the same goal: to reach (or depart) the vast wilderness of Lake Superior's southern shore.

Having outlined the difficulties manifest in travel to Lake Superior, this chapter will go on to dovetail the histories of these seemingly independent occurrences taking place on Lake Superior and illustrate the economic and social zeitgeist of Copper Country during, and immediately after the Civil War. Secondly, this chapter emphasizes the chief role that passenger/package freight propellers played in facilitating the development of these interests through the portholes of one of the most famous examples, *Pewabic*. The dissection of *Pewabic*'s economic elements will be followed with their rejoining, in a presentation of the

vessel's image and psychological importance to the pioneers residing in America's northern frontier. Just as *Pewabic* would be loaded on the docks at Houghton or Detroit, the histories of its cargo elements and package freight contracts will be presented first, followed by a discussion of the personalities that made this possible.

Barrels, Boxes, and Bags

In *A Study of Package Freighters on the Great Lakes*, Daniel Fletcher (1960:4) defines package freight as "any goods that do not come under the special definitions of bulk freight… It refers to freight moved piece by piece in containers of some sort or by individual units". Package freight, sometimes referred to as general cargo, is also defined by its ease of loading and unloading (Thompson 1991:20). It comprised items that were off loaded by hand trucks via ramps that bridged the steamer with the dock through the gangways on the sides of the vessel.

Package freight cargoes varied greatly in size and content. On its final downbound voyage, *Pewabic*'s largest cargoes were copper, iron ore, ship knees, barreled fish, and rolls of leather (Dismond 1955). On the Lake Superior-Cleveland route, merchants generally shipped raw materials downbound and imported manufactured goods and supplies that could not be grown or harvested in Copper Country. Upbound freight rates were negotiated well before the opening of the navigation season and lasted through the first of November (Grout and Whiting 1868). In an 1868 summer contract negotiated between JT Whiting and John Grout, of the Detroit and Lake Superior Copper Company (Hancock, Michigan) there is no discrepancy in upbound freight rates. Everything, from cigars to cement, tobacco to tallow, cost 27.5 cents per 100 pounds (Grout and Whiting 1868).

Downbound copper freight rates were also negotiated before the navigation season opened. When a vessel docked at a copper port, mining company agents and the vessel's master conducted inventory, also known as a cargo manifest. Each port had a unique cargo manifest template. When a vessel locked down at Sault Ste. Marie, its master might have four or five cargo manifests, depending on how many stops the vessel made. The manifests' heading legally binds the master with responsibility of the cargo. Beneath the heading, the manifest is organized into columns. The name of mining company, its headquarters, the number of items on board (barrels or masses of copper), and details of each individual item are included. Each individual item is assigned an identification number and a weight. Vessel masters then calculated the freight charge based on the weight of the copper and the negotiated season rate.

Freight rates skyrocketed due to ice flows that compromised vessel safety during the "Gales of November". November was always a gamble for shipping agents; many removed their vessels from service, but the outrageous November freight rates were often too good for some to refuse. The shortage of vessels allowed shipping agents to charge exorbitant rates; rates often climbed 300-400% on the 1st of November (Blair and Rives 1837:208).

During the 1860s, wooden passenger/package freight propellers were the most efficient means to move package freight in the Great Lakes region. *Pewabic*'s high-pressure engines were much smaller and carried less fuel than competing sidewheelers, which freed deck space for package freight (Lenihan and Murphy 1994:18). Passenger/package freight propellers' increased cargo capacity over sidewheelers kept freight rates low, somewhere between the low rates of sailing vessels and high end rates of sidewheelers (Gray 1998:30). Sailing vessels were least desirable in the package freight trade because they offered unpredictable delivery times (Bazzill 2007:28).

Not even the railroads competed with Lake Superior-bound passenger/package freight propellers in the 1860s. In 1865, Michigan's rail network was concentrated in the Lower Peninsula, with most major trunk lines radiating from Detroit, with the northern terminus at Saginaw, 250 miles south of Sault Ste. Marie. Michigan's rail system focused on the linkage between Chicago, Detroit and New York (Rodewald 1911:6). Railroads were even less prevalent in the Upper Peninsula. A single north-south line connected the iron ore ports of Escanaba and Marquette. From Marquette, a western arm stretched 40 miles westward to Lake Michigamme (Berry 2005). These isolated railways connected small, inland communities on the Marquette Range with the big lake boats that stopped at Escanaba or Marquette. It was not until 1884 that the Keweenaw was linked by rail with Chicago (Dunbar 1965:357). The absence of railways in Copper Country further amplified package freight demands on passenger/package freight propellers.

Foodstuffs (flour, butter, sugar) and luxury goods (coffee, tea, tobacco) were the most common upbound cargoes declared at the Sault Ste. Marie locks in 1865 (Carleton 1865:3). Outlying articles shipped on board passenger/package freight propellers include engines/boilers (25), cattle (664 head), and lumber (121,674 board feet)(Carleton 1865:3).

Downbound cargoes were much less varied. Copper, iron ore, pig iron, hides, and fish constituted the primary southbound cargoes (Carleton 1865:3). *Pewabic* carried all but one of these items (pig iron) on its seventh, and final voyage of the 1865 season (Table 1)(Dismond 1955).

Articles	Amount On Final Voyage	Total Amount Reported in 1865	% of Total	7 Trip Equivalent	7 Trip % of Total
Copper, tons	267	6735	3.96%	1869	27.75%
Iron Ore, tons	175	18,668	0.93%	1225	6.56%
Pig Iron, tons	0	2,337	0%	0	0.00%
Hides	27	3,058	0.88%	189	6.18%
Fish, 1/2 barrels	250	2,481	10.01 %	1750	70.53%

TABLE 1. Quantitative comparison of *Pewabic*'s cargo to total cargo shipped in 1865 including projected cargo tonnage for 7 *Pewabic* trips. (Table by Author, 2014.)

Red Gold

On the Keweenaw Peninsula, copper was king. It completely enveloped the economic territory; all infrastructure, vessels, and virtually all companies residing in the area had a connection to the industry (Lankton 1991:9). This was brought on in 1841 when Michigan State Geologist Douglass Houghton released a geological report of the Keweenaw Peninsula as "a source of eventual and steadily increasing wealth to our people" (Houghton 1841). The Ontonagon Boulder, a 3700-pound solid copper mass found near the Ontonagon River, supported Houghton's optimism (Rydholm 2006:27). Houghton's report and the Ontonagon Boulder persuaded the federal government to purchase the land from the Chippewa Indians via the 1843 Treaty of LaPointe. Shortly thereafter the federal government created a land use contract system. Mineral stake permits for the Keweenaw Peninsula were bought in Copper Harbor or in Washington DC and guaranteed the speculator rights to a nine square mile tract for one year (Lankton 1982:2).

Almost immediately, speculators scrambled to the Upper Peninsula and initiated the Keweenaw Copper Boom. Initially it was Keweenaw's surface native copper that drew speculator attention. This copper form was nearly 100% pure and the Keweenaw possessed the world's largest deposit. It is found as flakes embedded in conglomerate rock, in thick amygaloid

veins, or as massive boulders strewn on the surface by prehistoric glacial movements (Lankton 1991:8).

The one hundred-mile long Keweenaw Peninsula was divided into three mining districts, lineally arranged from north to south. Each district had its own copper character and required vastly different methods of extraction (Krause 1992:200). The first mines to open were at the tip of the Peninsula, near the towns of Copper Harbor and Eagle Harbor (Dunbar 1965:253). The latter was the principal copper port during the 1850s (Morin 2013:28). The northern district possessed vast crosscutting veins and significant caches of mass copper. The Cliff Mine, opened in 1845, was the most profitable of these operations and sustained speculator optimism despite the failure of most of its neighbors (Lankton 1982:4).

Eighty miles south, the Minesota Copper Mine initiated settlement in Keweenaw's southern mining district in 1847. Similar to the Cliff, the Minesota mine was sustained by one major vein that produced substantial masses of native copper. The largest weighed 527 tons and required the efforts of twenty men over one year to extract it (Kilpela 1996:5).

Unfortunately, the quick profits associated with these massive copper pieces were exhausted by 1870. Industrial archaeologist Larry Lankton (1991:10) remarks that the Cliff and Minesota "were false harbingers of the district's future". Dividends were paid, but their fissure fortunes came to inevitable ends. As these veins in the northern and southern ends of the Keweenaw decreased in production, spectators looked to the middle of the peninsula for sustainability in the middle 1850s.

Portage Lake is a large basin centered on the Keweenaw Peninsula that has one natural river that flows east into Lake Superior, Portage River. However, it took time and development before passenger/package freight propellers like *Pewabic* could dock at Houghton. Until 1862,

only vessels drafting less than 4.5 feet could enter the lake and safely approach Houghton's docks. Vessels with deeper drafts were forced to anchor outside the mouth of Portage Lake, fourteen miles from Houghton. They contracted lighters that transported package freight and copper between the anchored vessel and the docks (Gates 1951:19). Small boats (lighters) or barges executed this tedious process. Lighters charged mining companies and merchants four dollars per ton to traffic cargo the fourteen miles to Houghton (Lankton 2010:33, 40).

The Portage Lake district lacked the get-rich-quick schemes of its northern and southern neighbors, hence its later development. Mining operations here focused on extraction of small traces of copper from amygdaloid or conglomerate lodes. Conglomerate rocks, locally referred to as "copper rock", were 2% copper and 98% waste and required stamping mills to crush the rock and sift out copper (Lankton 1991:10). These added steps in production greatly increased operational costs and required more initial investment. Quincy Mining Company, the most famous of these "Lake mines", paid its first dividend fourteen years after initial investment (Lankton 1982:18). Despite the early hardships, Quincy became known as "Old Reliable" and produced dividends from 1867 to 1921 (Kilpela 1995:3). Its example spurred the creation of neighboring Franklin and Pewabic mines.

Once copper rock was stamped, it went to the smelter. Smelting was an expensive process, especially in the remote Keweenaw Peninsula, because it required ample amounts of coal for fuel (Lankton 1991:12). Consequently, the ore was shipped to early smelters that congregated around Boston and Baltimore, where coal was easy to obtain (Gates 1951:28). By the end of the 1850s, the majority of Keweenaw copper was smelted in furnaces along the Cleveland and Detroit waterfronts (Hyde 1998:24). The Waterbury and Detroit Copper Company, of Detroit, was one of the largest, and stamped each mine's makers mark on every

ingot (Lankton 2010:40). Portage Lake Smelting Works followed close behind in 1861 and brought smelting services directly to the Lake mines.

Independent contract smelting dominated Michigan's copper industry well into the 1890s. Only the biggest mines invested in their own private smelter, and these were built close to the turn of the twentieth century (Morin 2013:33). Keweenaw Peninsula smelting agents, like John Grout, smelted copper for numerous mines in varying quantities. Contract smelting reduced the number of vessel stops because most Portage Lake copper terminated at the Portage Lake Smelting Works dock.

Despite the more-intensive production processes, Portage Lake possessed a key natural feature that gave it the advantage over the northern and southern districts: an inland lake. The Lake mines were perfectly situated on an inland waterway that fed directly into Lake Superior. The inland water system is much calmer and conforms to waterfront development better than the big lake. It also serves as shelter for boats caught in turbulent Superior storms in a region with few natural harbors.

In 1860 the Lake mines collaborated resources and spent $30,000 to dredge the mouth of the entry (Gates 1951:19). Known as the Portage Lake Ship Canal, the largest lake boats now had access to the Houghton docks. Most importantly, the Portage Lake Ship Canal focused commercial copper mining on the towns of Houghton and Hancock. John H. Forster, an engineer for the Portage Lake Ship Canal Company describes the moment when the first lake boat entered the Portage River: "Great was the rejoicing of the inhabitants; fierce and loud was the shrieking of stamp mill whistles, as the boat hove in sight. It was a gala day at Portage; a new era was inaugurated" (Lankton 1982:17).

Mines and smelters worked through winter, and copper awaiting downbound shipment was stacked at the docks of Portage Lake Smelting Works. Boats, on the other hand, could only pick up cargoes when the navigation season was open. During the Civil War, the locks opened in the first week of May and closed by the first week of December (Kelton 1888:15). Consequently, there were stacks upon stacks of barrel copper, ingots, cakes, and slabs lying dormant on at the smelter docks. The buyer determined size and shape of the finished copper. Copper was poured into ingots for remelting or brass/alloy creation, cakes for rolling into sheets, or rectangular slabs for use in wire and rod manufacture (Morin 2013:31).

Copper in the Civil War

Demand for copper rapidly increased during the war (Figure 4)(Beeson and Lemmer 1966:26). The years 1862-1866 witnessed the greatest price surge in Copper Country's history (Gates 1951:16). Copper was utilized in items such as brass buttons, bronze canon, pots, canteens and other military equipment (Beeson and Lemmer 1966:27). Despite the increase in demand and price, Keweenaw copper production dropped significantly during the war. Between 1862-1864, copper production fell by 2.5 million pounds for four reasons (Gates 1951:16). First, like most areas in the Union, Copper Country suffered a labor shortage during the war. Unlike other areas, however, the labor shortage was caused by the departure of men working in established mines who sought employment at new, or struggling mines. Lankton (2004:2) illustrates this economic situation: "The war encouraged investors to open or reopen smaller properties, thinking that if they were ever going to make money from this marginal deposit, now was the time".

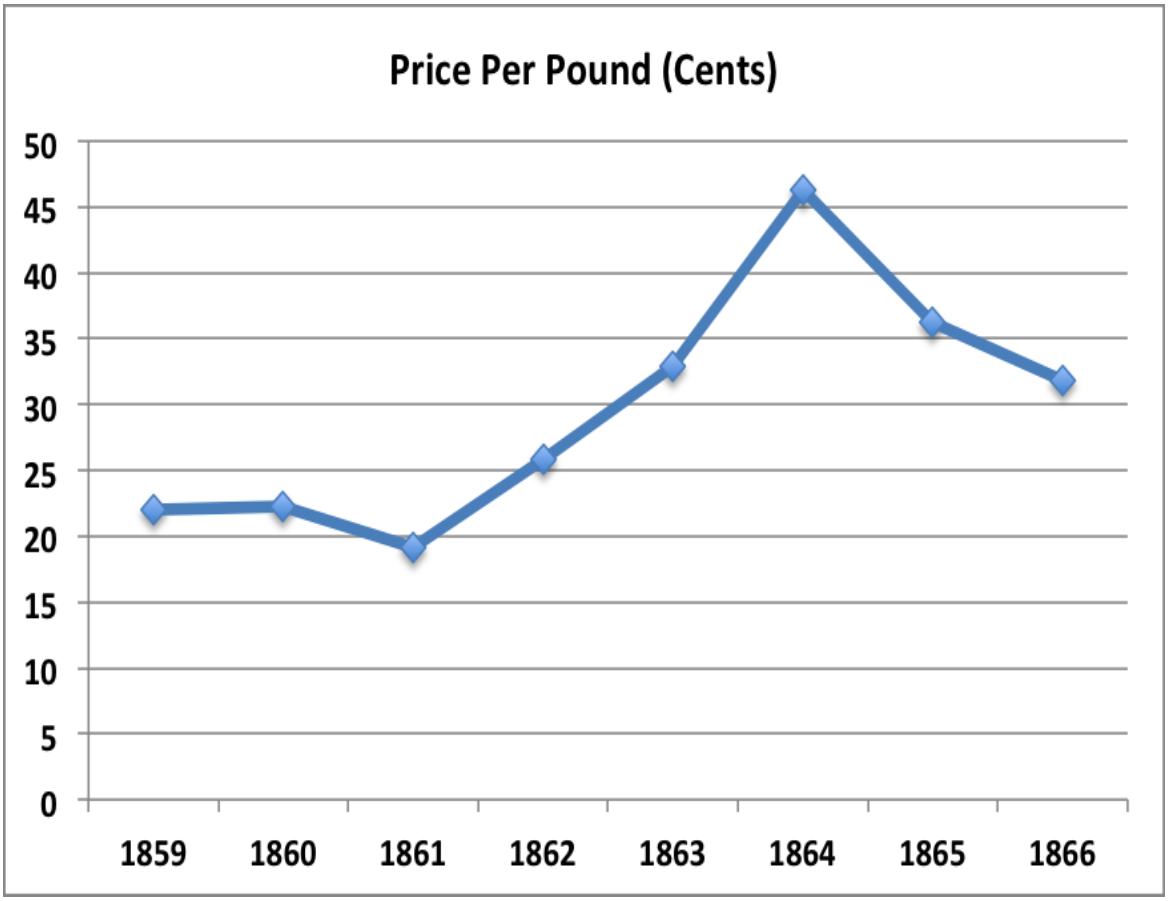


FIGURE 4. Copper prices 1859-1866. (Figure by Author, 2014.)

East Coast investors rapidly reopened mines that were not previously profitable. Between 1861 and 1864 the number of producing companies jumped from twenty-one to fifty-two despite the labor shortage (Hyde 1998:41). Few of these companies, however, produced substantial returns and the bigger operations suffered from the labor shortage (Figure 5)(Beeson and Lemmer 1966:16).

Secondly, production faltered because the region could not easily obtain machinery during the war. Military contracts took precedent, and manufactures were too occupied with the war effort to sustain the material needs of northern mining operations (Lankton 2004:2).

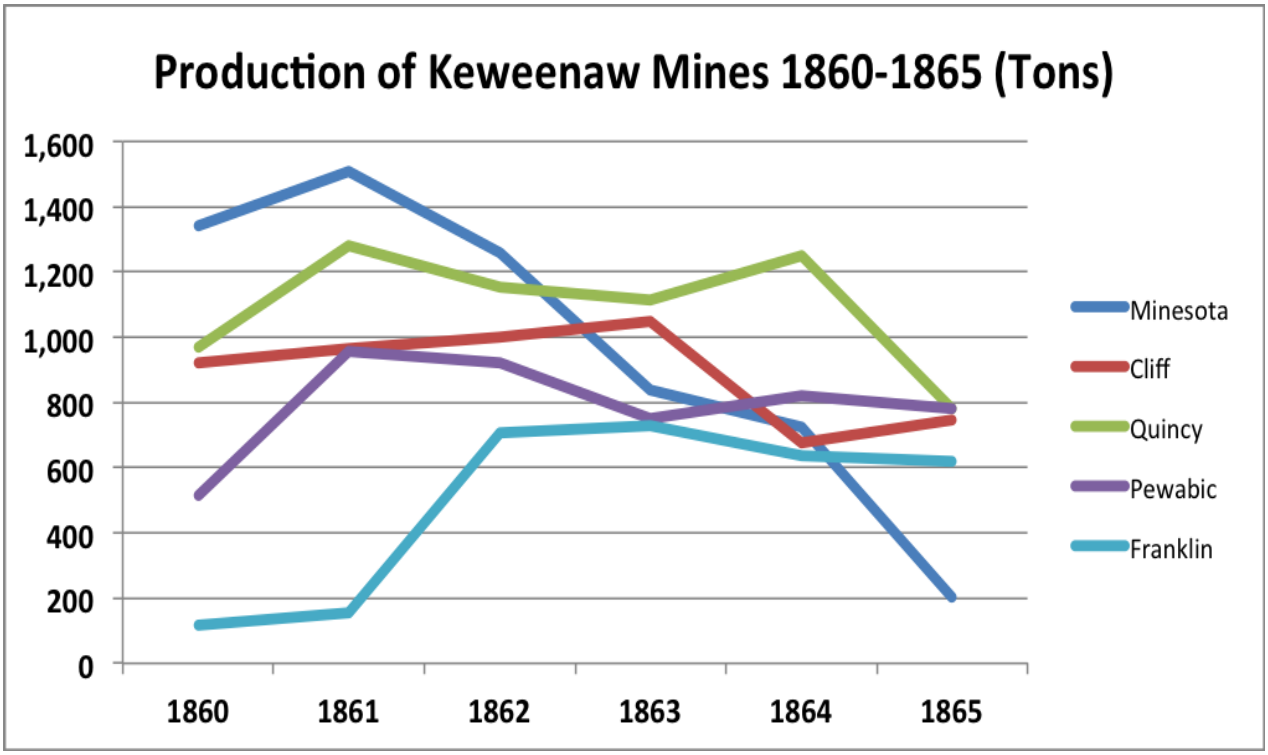


FIGURE 5. Production of Keweenaw mines 1860-1865 (Tons). (Figure by Author, 2014.)

A third explanation for the drop in production is that the fissure vein and mass copper mines, notably the Cliff and Minesota, were already reaching mineral exhaustion. Copper historian William Gates (1951:16) argues that the decrease in production from these goliaths was not caused by the war at all; these mines were simply "running dry".

Lastly, the ethnic fractionalization of immigrant miners in the Keweenaw always posed a threat to copper operations. The Quincy Mine even built segregated neighborhoods for their labor force. The Irish occupied the Limerick, the Cornish lived in Hardscrabble, and the Swedes congregated in Swedetown (Lankton 1999:65). Not only did each ethnic group have their own residence, they each had particular labor specialties, and cultural customs that strengthened their bond as a cultural unit. The cultural units rarely fraternized, and consequently did not unionize. However, social and economic competition between factions regularly promoted social unrest, which occasionally materialized into organized labor strikes.

The 22% price drop in copper between 1864 and 1865 was enough to instigate such an organized labor stoppage. The three-week "Peninsula War" in July of 1865 exemplifies the threat that immigrant social unrest posed to copper production. Though rare in occurrence, these events required swift, tactical reactions by the greatly outnumbered mining agents. The mid-summer episode in 1865 necessitated intervention by the sidewheel warship USS *Michigan*, whose glistening howitzers and cannonade displays encouraged the revolting immigrants back to the mine shafts (Rodgers 1996:100).

Despite the region's decrease in production, copper remained the most profitable cargo for passenger/package freight propellers during the 1860s and 1870s. The 267 tons on board *Pewabic* was worth $193,842 in 1865. Second to copper was the soft iron ore that eventually surpassed all other cargoes in volume in 1888 (Thompson 1991:20).

Different Mineral, Same Transport Problems

The discovery and pre-Civil War history of Upper Peninsula iron ore paralleled copper's history (Dunbar 1965:365). Douglass Houghton and William Burt first discovered the Marquette Iron Ore Range in 1844 while on the hunt for copper. Their report attracted prospectors, and small-scale operations began one year later. Marquette iron pioneers faced the same early transportation difficulties as the copper miners before 1855 (Thompson 1991:20). Once the locks were constructed, Michigan's iron ore industry took off.

In 1855, 1,400 tons of ore were shipped south in barrels. One year later, 11,500 tons passed the locks, an increase of over 800% (Thompson 1991:20). By 1860, the figure grew to 124,000 tons. By the end of the Civil War, the Marquette range was established, with blossoming companies, a steady stream of vessel traffic, and necessary infrastructure. Despite the large

volumes required to make profit, iron ore had become a notable competitor to its red-colored cousin. Above all, iron ore was easier to extract (Walker 1979:8). The iron ore was much closer to the surface than the amygdaloid copper found in the Portage Lake mines. Men simply had to clear the natural landscape, remove sod and soil and break the iron beds apart with picks and sledgehammers (Rubenstein and Ziewacz 2008:78).

Dedicated ore carriers transported iron ore, a vessel class that remains on the lakes today. Iron ore was a primary cargo, and ore carriers rarely carried anything else. The ore is dirty and voluminous, which left little room for package freight or passengers. Between the 1850s and early 1880s, most iron ore was transported by sailing vessels and loaded through wide deck hatches (Rubenstein and Ziewacz 2008:78). The "pocket" dock was a critical invention that greatly expedited the loading process for downbound ore carriers. Ore was staged via rail car in elevated storage bins, or pockets at the end of the dock, and ore carriers moored underneath. Chutes then funneled the ore down into the open cargo hatches (Stonehouse 2011:53). Due to the passenger cabins, passenger/package freight propellers had no vertical access to their cargo holds and main deck. For large shipments, loading through their side gangways was laborious and not conducive to bulk cargo transport. Nevertheless, *Pewabic* made regular stops at Michigan's iron capital in 1864-5. Traditional ore carriers could not meet the high demand from the industrial and military sectors, so passenger/package freight propellers handled surplus cargoes.

In JT Whiting's 1865 *Pewabic* window advertisement, iron is mentioned in the propeller's itinerary: "touching at Marquette, where exist perfect mountains of iron" (Pioneer Lake Superior Transit Company 1865). Marquette was likely *Pewabic*'s last stop before locking down to Lake Huron at Sault Ste. Marie. In 1865, iron ore sold for between $13 and $15 per ton (Wells 1866:327). At these prices, the 175 tons on board *Pewabic* on its final voyage was worth

between $2275 and $2625, an insignificant sum when compared to its copper cargo worth $193,842 in 1865 (Beeson and Lemmer 1966:26).

General Cargo

Though copper and iron ore were *Pewabic*'s main cargoes, leather, fish, and ten tons of miscellaneous freight were also on board on its final downbound voyage (Thompson 2000:158). The 27 rolls of leather were most likely headed for one of the dozen tanneries in Detroit. These tanneries fed local shoemakers who were instrumental in the war (Detroit Board of Trade and Scripps 1868:24). The 250 cumulative half barrels of fish was picked up in Detour, Ontonagon, and Bayfield, and bound for market in Detroit or Cleveland. The ship knees were headed for the Campbell and Owen shipyard in Detroit (Dismond 1955). The remaining miscellaneous freight could have been anything, literally. Most likely it was goods that were shipped without a written contract, negotiated between captain and merchant at dock. A rotary saw blade, for example, was recovered from *Pewabic*'s wreck site that supposedly needed sharpening (Smith 1974).

While little is known about these other articles of downbound cargo, they do shed light on *Pewabic*'s versatility. *Pewabic*'s capability to carry everything from native copper to barreled fish to leather hides was crucial for all settlers in Copper Country, not just copper agents. The region's smaller industries relied on consistent and dependable vessel service just as much as the copper and iron ore industries. Schooners and other sailing craft did not fill these needs because they were occupied as single-cargo carriers of iron ore, grain or other bulk articles.

Passenger/package freight propellers were the principal facilitators of these small industries. Their gangways and frequent stops in the Upper Peninsula made them the only dependable option for getting fish and leather to the lower lakes. *Pewabic*, and the passenger/package freight propeller class, successfully facilitated the freight needs of both large

and small producers. In Portage Lake, everyone from the wealthy smelter agents to the surviving fisherman relied on these vessels for their subsistence.

'All Aboard!

As the class name passenger/package freight propeller implies, package freight transport was only part of *Pewabic*'s critical role in the development of the Keweenaw Peninsula. Just as it trafficked myriad cargoes to and from Copper Country, *Pewabic* attracted passengers from all walks of life to reach the Keweenaw. Mining officials, laborers, families and travelers filled the deck and saloons on the ten-day cruise. Some had one-way tickets; others planned to return. *Pewabic* was a representative microcosm of the socioeconomic dialogue present in the United States after the war. One deck separated the rich from the poor, yet they could easily hear one another speak.

Steam Travel Gets Accessible

After the Civil War, more Americans utilized marine transportation networks for vacation. While palace steamers were popular excursion boats in the early 1850s, their extravagant ticket prices excluded all but the upper class. These ornate vessels were nearly extinct from the lakes after the Panic of 1857 and the Civil War (Thompson 1994:11). Passenger/package freight propellers could offer more reasonable rates because passenger traffic was not the sole source of income for their owners. Profits from package freight and the copper industry kept rates low. Families now traveled long distances for leisure, not just for employment or relocation for the first time. Summer vacations increasingly became part of the middle-class lifestyle. White-collar workers now had paid time off, and were attracted to vacations that promised healthful rejuvenation and relaxation (Aron 1999:4).

The Civil War helped foster this new American hobby. Soldiers from as far north as Houghton traveled hundreds of miles to the battlefield via rail and steamship. Once fighting ceased on April 9, 1865, soldiers became acquainted with the iron and water highways that brought them home. Many of these men had not previously experienced a steamboat ride, or a journey on board an iron horse.

The increase in steamboat excursion demand is directly related to the emergence of the middle class in post-war America. Membership to this expanding American group was no longer restricted to the self-employed, independent businessman as it was defined in the early nineteenth century. Salaried employees of America's growing corporate economy joined the middle class ranks in the 1850s and 60s. The middle class American used recreation, travel, and leisure to distinguish himself from members of the working class. The necessity for vacation as a tool for health and rejuvenation became a standard middle class creed during the 1860s. Vacations "were intended to renew and refresh, refueling vacationers for the challengers of middle-class life" (Aron 1999:93).

Excursion vacations presented an arena with loosened middle class behavioral norms. Flirting, dancing, and drinking were encouraged practices on board excursion vessels that otherwise were considered socially coarse. The vessel was a preferred vacation tool because these peripheral behaviors were deliberately encouraged and virtually unavoidable. Saloon cabins opened directly into the dining room, where these off-piste behaviors were performed day and night. Vessel's mobility was another feature that the rising middle class enjoyed. Passengers enacted peripheral behavior on a platform that physically removed them from society, which further loosed social boundaries. These elements brought excursion travel on board

passenger/package freight propellers in vogue and the industry experienced tremendous growth in the middle 1860s.

Round trip steamer passage through the locks at Sault Ste. Marie increased from 305 in 1863 to 395 in 1865. *Pewabic* accounted for seven of these in 1865 (Carleton 1865:13). On its final voyage, Charles A. Mack, survivor and clerk of *Pewabic*, estimated between 100 and 125 cabin and steerage passengers were on board (Dismond 1955). Survivor accounts from first class passengers and newspaper reports provide the only clues to *Pewabic*'s passenger demographic, as the manifest went down with the ship.

Life Upstairs

Elegant first class cabins occupied most of *Pewabic*'s hurricane deck. Each cabin had a water view and opened inwards to the large dining saloon. The crew showed first class passengers every courtesy and spared no expense. Champagne flowed, live music resounded, animals and people bellowed, and excursionists mingled all the way to the Keweenaw. First class passage on board elegant passenger/package freight propellers was as much about the journey as it was about the destination. First class passengers were JT Whiting's target audience in advertisements: "Invalids who need Cool, Dry, Bracing, and Invigorating Air" (Pioneer Lake Superior Line 1865). The advertisement emphasizes the ten day trip's ability to improve one's health and serve as therapy for post-war America. The relaxing atmosphere followed *Pewabic* as it made its rounds to the small hamlets and copper towns of the Keweenaw.

Pewabic's package freight obligations were no secret. The advertisement spins their mining destinations as "perfect mountains of iron… new discoveries of silver and lead… ample opportunity is given to visit the stamping mills of the Quincy, Pewabic and Franklin copper

mines" (Pioneer Lake Superior Transit Company 1865). Tickets bought for first class passage on board *Pewabic* were also recognized on *Meteor*, so passengers like Mr. R.H. Russell stayed in the Keweenaw and took a later boat south. Passengers took advantage of this flexibility. Houghton, Mackinaw Island, and other northern summer vacation destinations were only accessible by steamer in the middle nineteenth century (St. Mane 2010:27). Russell was one of the few survivors of the 1865 collision whose account was published in local news. He describes *Pewabic*'s atmosphere as it pulled away from Houghton:

> There was an excursion party aboard composed of passengers from Ohio, Cleveland, Detroit, and other cities and inland towns. I had been north and was returning with important papers to submit to President Johnson in Washington, DC. I had passed two or three days with a schoolmate in Houghton, Charles Smith, who was identified with one of the great mining projects in upper Michigan. The steamer was gaily decorated with banners and pennants and was indeed a thing of beauty. When she backed away from the dock a band was playing and hundreds of people smiling a bon voyage to all on board (Dismond 1955).

First class passengers, like Russell, traveled for pleasure, business, or a combination of the two (St. Mane 2010:28). University of Michigan professor S.H. Douglas, his family and Will Whiting, son of JT Whiting were notable passengers on board *Pewabic* (*Alpena News* 1917c). Though, as mentioned, the manifest was lost with the ship, a list of ninety-nine passengers known to be saved or lost was published days after the collision in *The Erie Daily Dispatch* (Figure 6)(*Eerie Daily Dispatch 1865a)*.

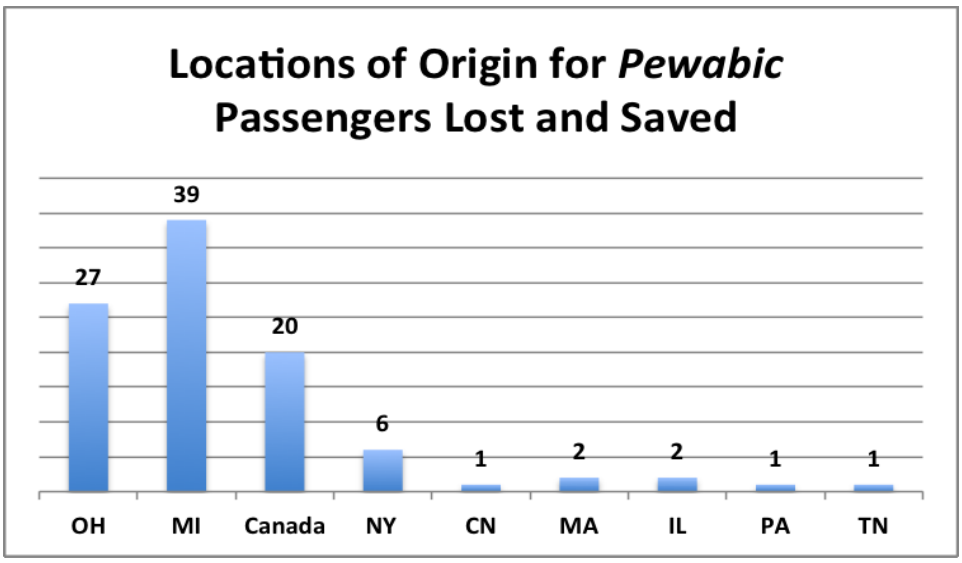


FIGURE 6. Locations of origin for Pewabic passengers lost and saved. (Figure by Author, 2014.)

66% of passengers originated from Ohio or Michigan. Within this figure, a third resided in Cleveland or Detroit, *Pewabic*'s two principal lower lake ports. These statistics suggest that most of the passengers on board *Pewabic* on its final voyage were excursionists from the Mid-West region. In the post-war North, the middle class had little desire to vacation in the South. Southern vacation infrastructure had been damaged and neglected during the war. Hotels were often converted to hospitals, riverboats were out of service, and the topography was bloodstained, metaphorically and literally (Aron 1999:49). The hot, humid climate and pro-slavery attitude further deterred Northerners from vacationing in the South.

Passenger/package freight propellers on the Lake Superior Route also serviced international businessmen and travelers from Canada. Southbound passage on passenger/package freight propellers was often the first leg of Canadian itineraries because no rail infrastructure existed north of Saginaw (Jensen 2014, elec. comm.). For business men and Europe-bound travelers, Detroit and Cleveland were the Mid-Wests' railroad gateways to reach the Eastern seaboard. *Pewabic*'s first class cabins also offered desirable accommodations for Canadian

travelers who had lengthy itineraries. *Pewabic* not only facilitated travel for regional excursionists and international travelers, but also blue-collar workers.

Life in Steerage

Steerage passengers were largely absent from view during *Pewabic*'s ten-day cruises north. They secured passage for half the price of a first class ticket and their experience was proportionally diminished. Little order was kept below decks. Few provisions, if any, were provided. They slept amongst the barrels and boxes of package freight on blankets or hay. Some passenger/package freight propellers granted steerage passengers sleeping space on the exposed hurricane deck, but this practice was more common during the immigration floods of the late 1850s. Meals were not included; steerage passengers were responsible for their own food (St. Mane 2010:35). Life in steerage was dark, even during the day. Only the light that squeaked through gaps in gangway doors reminded them they were at sea.

Unlike the first class vacationers upstairs, steerage passengers traveled on board propellers for the destination, not the journey. Price was the ultimate factor in vessel choice, and older vessels on the Lake Superior route offered much cheaper rates. Convenience also played a factor. Southbound residents in small northern villages like Bayfield had fewer vessel options due to fewer port visitations than the larger ports of Copper Harbor or Houghton.

Nevertheless, post-war steerage passage was much more comfortable than in the middle and late 1850s. In this earlier period, northbound sidewheel steamers were dangerously overloaded with immigrants (St. Mane 2010:29). Between 1850 and 1870, Copper Country's population soared from 1,100 to 21,000 (Lankton 1999:57). The majority arrived on sidewheelers, but some made the journey on board passenger/package freight propellers. In 1860, two out of every three residents in Houghton County were foreign-born (Lamarre

2003:60). Miners and laborers from Cornwall, Finland, Sweden, French Canada, Germany, Norway, and Ireland bought steerage passage to the north country (Glazier and Helweg 2001:68).

The decline of sidewheelers limited steerage options to sailing craft or passenger/package freight propellers in the years following the Civil War. Even though most of the large-scale immigration to Copper Country occurred in the antebellum years, steerage passage demand was still present after the war but is difficult to quantify, as it was analogous to flying stand-by in the twenty-first century. Steerage passengers often bought their tickets at the dock from the ship's purser (St. Mane 2010:49). To the purser, steerage passengers were much easier to accommodate. They brought their own food and only required a piece of floor for living space and luggage storage. First class passengers, on the other hand, generally made reservations to secure their cabins and meals. Whiting likely knew *Pewabic*'s first class occupancy before it departed Cleveland on July 31, 1865, but would know virtually nothing about the number or specifics of the steerage passengers.

Like the package freight they slept on, steerage passengers could have been traveling from Copper Harbor to Houghton, or from Cleveland to Marquette. Steerage prices were negotiated between the purser and the interested party based on distance and amount of luggage. Steerage passengers often helped the crew load cord wood for the boilers to get a discounted rate (St. Mane 2010:30). Varying final destinations also made profits from steerage passage difficult to predict, or quantify.

Furthermore, the Sault locks was the only institution that counted passengers in and out of the Upper Peninsula and their records do not distinguish first class from steerage. In the 1860s, vessels passing through the locks reported their passenger count to the Superintendent,

who totaled the amounts for each season. On the annual reports for the canal, it was customary to split the passenger statistics between those who came from Chicago, and those who came from Detroit or Cleveland. The figure below reflects the cumulative reports for the fourteen passenger/package freight propellers that passed into Lake Superior from Cleveland or Detroit (Figure 7)(Carleton 1865:10).

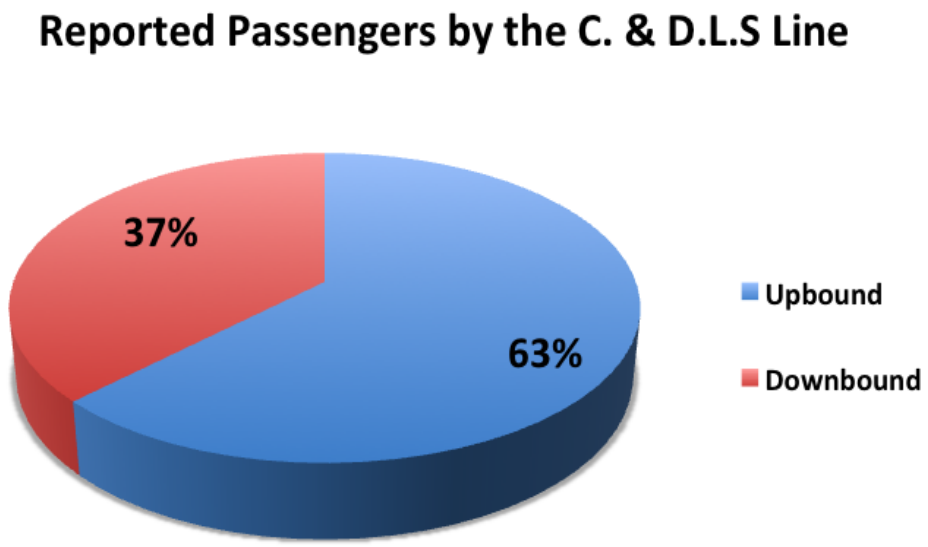


FIGURE 7. Reported passengers on the Cleveland and Detroit Lake Superior Line who passed through the locks in 1865. (Figure by Author, 2014.)

This figure illustrates the importance of passenger/package freight propellers' steerage passage capabilities in 1865. It is clear that more people traveled north on one-way tickets than people traveling south, or on round-trip voyages. Though the degree is quantitatively unknown, *Pewabic* facilitated the steerage passenger industry that was crucial in supplying and moving immigrant labor to and around the Keweenaw Peninsula.

Boats in the Keweenaw Psyche

Henry Hobart, was a Vermonter who taught grade school in the Copper Country between 1863 and 1864. His grim existence radiates from the pages of his diary, the only published journal that concerns the arduous daily life of a Keweenaw resident in the 1860s. He reported on bar brawls, rampant alcoholism, and the difficulties of teaching in an industrial town. While bothersome, these experiences did not match Hobart's continual struggle with his geographic isolation:

> April 14, 1863 : We are now enjoying very fine weather and the snow is melting away very fast. There is nothing to prevent a boat from coming up now and we expect one every day.
>
> April 23, 1863 : As I sit upon this high bluff and look upon the clear waters below stretching far beyond the reach of sight, I think how pleasant this scene would be if a steamer from Detroit should loom up in the distance with fresh things from below and perhaps letters from parents, sisters and friends in Vermont. A boat is expected soon.
>
> April 26, 1863 : What comfort it is to thus enjoy the beautiful weather of spring after a long cold winter. And it would be much more cheering if the boat would come up and we could get some of the luxuries of life.
>
> May 2, 1863 : Yesterday was a day of great rejoicing with the people of our village for the following reason. We have been in a very starving condition or deprived of meat and almost everything else except bread and yesterday a boat came in at the River with cattle and many fresh articles from below necessary to supply out physical wants.
>
> November 23, 1863 : I should like to hear from home and also the war news. I suppose it will be sometime before I have a letter as we must now wait for an overland mail. It will be about six weeks before any can reach us (Mason 1991:116, 127, 129, 135, 231).

For Hobart, and all of the Keweenaw in the 1860s, only the boat could quench their thirst for their longing of civilization. It brought not only basic survival provisions and occasional luxuries, it brought hope. The boat was the only connection to the worlds that everyone in the Keweenaw had left behind. Mail and news arrived every few days for half of the year, and might be delivered five times during the other half. As Hobart illustrates in his journal, everyone knew that salvation was near once the snow began to melt.

On August 1st, 1864 Hobart boarded *Pewabic* to return to Vermont: "She is beautifully ornamented inside and painted black outside. There is a deer's head, neck and horns on the top of the pilot house that is a fine piece of workmanship" (Mason 1991:311). Hobart describes the vessel akin to the oasis mirage for the desert traveler. Its luxuries on board were a "pleasant change to one who has been confined to the rocky bluffs of Lake Superior" (Mason 1991:312). The journey never lacked excitement: "We are running fifteen or twenty miles an hour and the spray rolls away from our noble propeller in fine style as she cuts the water with her heavy load…I should prefer to go on the *Pewabic* to any other boat on the Lake" (Mason 1991:311).

As detailed in previous pages, passenger/package freight propellers reflected and enforced the social and economic zeitgeist of the Great Lakes during the 1860s. Few vessels in the history of humans and the sea juggled the numerous responsibilities and interests bestowed upon passenger/package freight propellers. Their versatile capabilities were exceptionally effective in the northern frontier. They were profitable vessels that invested themselves in providing necessities to a region accessible only by water. They did not depend on the wind, nor on one export. They carried everything, and everyone.

To the middle nineteenth century Keweenaw resident, passenger/package freight propellers were the only means to sustain life. They were the way in, and the way out. They

brought necessary provisions, and left with even more important cargoes. They brought laborers and tourists to the region, and returned frontiersmen, like Hobart, back to civilization. Most importantly, these boats facilitated these interests and satisfied the needs of the Keweenaw on every voyage. In the 1860s, they were the key to survival, prosperity, and hope for those northerners who truly lived *beyond the boundary*.

CHAPTER THREE: ORIGINS OF PASSENGER/PACKAGE FREIGHT PROPELLERS AND THE ARCHAEOLOGY OF *PEWABIC*

Introduction

It was August 9th, 1865, four months after Robert E Lee's surrender at Appomattox courthouse. Union supporters across the Great Lakes region celebrated the end of America's bloodiest conflict. The Lakes and their resources were vital to the war effort, and northerners knew it well. Historian James Barry writes: "The development of iron and copper mines on Lake Superior and the opening of the canal at Sault Ste. Marie ensured that the Civil War would bring a boom to the Great Lakes - and perhaps even ensured a Union victory" (Barry 1973:93). The Civil War caused package freight and bulk cargo rates to skyrocket beyond any expectations. Between 1861 and 1864, the price of native copper from Lake Superior's remote Keweenaw Peninsula more than doubled (Lankton 1999:107). At the time, Lake Superior's beauty was entrenched in its isolation and reluctance to domestication. In the beginning of the nineteenth century, Superior seemed untouchable, but as time passed, shipbuilders developed the key to its exploitation: the passenger/package freight propeller.

They were fast, yet fuel efficient; large in tonnage, but small enough to squeeze through the locks at Sault Ste. Marie. This chapter illustrates the origins, heritage, and purpose of these vessels through *Pewabic*, one of the most grand and unique of its class. Beginning with the rise of steam technology, this chapter will detail the transition from paddlewheel to propeller, the city of Cleveland's role in the Lake Superior Route, *Pewabic* as a unique class example, and the particulars and aftermath of Lake Huron's worst maritime disaster. After establishing historical context, this chapter will dive to the wreck of *Pewabic* and illustrate how its history is displayed

on the lake bottom. Collectively, this chapter continues the illustration of the role of wooden passenger/package freight propellers in the development of Lake Superior, and their place in nineteenth century Great Lakes economy.

The Need for a New Vessel

Beginning with the opening of the Eerie Canal in 1825, fledgling freshwater cities and isolated coastal towns alike required stable and frequent contact with the Atlantic, and with each other. The lakes economy needed a reliable vessel type that would transport people and package freight. Beginning with European immigrants, passage on board passenger carriers was later occupied by settlers heading west, businessmen, and excursion passengers by the middle nineteenth century. Package freight has been distinguished as "any goods that do not come under the special definitions of bulk freight…It refers to freight moved piece by piece in containers of some sort or by individual units" (Fletcher 1960:4).

While schooners occupied this market in the 1820s and 1830s, they were not built to comfortably accommodate passengers or handle package freight that was difficult to load and unload through deck hatches. Sidewheel steamers transported hoards of people, but only stopped at major ports. Furthermore, their bulky engines and machinery offered little space for package freight below decks.

After the Civil War began in 1861, many western resources were sent to aid the Union: men, ships, foodstuffs, and raw materials. Most Great Lakes shippers exported ships to engage in the coasting trade along the eastern seaboard while few remained on the lakes to move bulk and package freight cargo. Many steam operators sold or leased vessels to the federal government. One example being the *Maple Leaf* (1850), which served nineteenth months as a troop transport

until it struck a Confederate torpedo in 1864 (Cantelas 1995:8). In 1861, 3,034 American vessels traded on the lakes; four years later this number was cut to 1,430 (Stebbins 1869:168). The sharp decrease in tonnage shipped during the Civil War demanded innovation and creativity in the lake shipbuilding industry. The Great Lakes needed a utilitarian vessel that could navigate locks, transport cargo, and offer passage at reasonable rates. The wooden passenger/package freight propeller was the answer.

Vandalia: Passenger/Package Propeller Prototype

While sidewheelers were synonymous with steamers in the middle nineteenth century, propellers were present on the lakes since *Vandalia* (1841) carried package freight and passengers on Lake Ontario. *Vandalia* became the prototype for passenger/package freight propellers to come. At 91' long, 20' in beam, and an 8.25' depth of hold, *Vandalia* had the lines of a boxy canal schooner designed to pass through the Welland Canal (Lenihan and Murphy 1994:51). But its twin high-pressure direct-acting engines gave it guaranteed speed and reliability that no canal schooner could offer.

John Ericsson, builder of *Vandalia* and credited as inventor of the twin screw propeller, foresaw propellers' advantages over sidewheelers: 1) propellers have less drag, 2) are more suited for inland navigation and lock travel because of the decreased beam without side paddlewheels, 3) occupy less space in crowded rivers and ports, 4) do not create large swell, 5) generate less vibration, 6) have compact engines that have less distressing effects on the hull, 7) are less likely to be mechanically disabled in war because the engines are beneath the waterline and 8) existing sailing vessels can be outfitted with propeller technology (Stewart 1837).

Ericsson's vision materialized in the 1850s. Coupled with the late demise of the palace steamer in 1857, the construction of the St. Mary's Locks at Sault Saint Marie in 1855, and the

need for more efficient steamers gave birth to the era of the wooden passenger/package freight propeller. These transitional vessels found their role as fast carriers that could access remote ports and squeeze through the locks that connected the inland seas. The passenger/package propeller is arguably the only nineteenth century Great Lakes vessel type that catered to both passengers and shipping demands successfully. Many, like *Pewabic*, were tramps that also carried variant package freight along their routes. Most importantly, they were cheaper to build, and could cater to a broader passenger market. By the spring of 1858, there were 52 more propellers than sidewheelers (Mansfield 1899:680).

Passenger/package freight propellers were especially popular with railroad companies who needed efficient means to connect their iron rails across the inland seas (Rodgers 2013:27). Their shallow draft granted passenger/package freight propellers access to remote, often undredged harbors where larger sidewheel passenger steamers had no hope of reaching. It was in these small, isolated ports that passenger/package freight propellers found their niche. Furthermore, their exceptional speed and service mirrored the railroad experience that excursion passengers expected. Passenger/package freight propellers often served as mobile connections for people, and product across fragmented rail networks.

Service routes in the passenger/package freight business were determined by demand from both passengers and businesses. The Lake Michigan Route, for example, was sustained by palace steamers until propellers took over after the Panic of 1857. The Lake Superior route, on the other hand, was a new frontier for steam travel. Even if the locks at Sault Saint Marie were completed during the height of the palace steamer era, the sixty four foot breadth of the locks would trouble lake sidewheelers. Known as the “Miracle Mile”, completion of the canal was welcomed with great enthusiasm:

> On June 18 following, the steamer *Illinois* passed up and the steamer *Baltimore* passed down, and these were the first vessels to use the canal that opened to mankind the greatest mineral domain in the world, and which has conferred a vast blessing upon the country (Williams 1905:133).

At the time of completion in 1855, the two locks at Sault Ste. Marie were the biggest in the world. They were the keystone to the untapped mineral resources that would fuel America's Industrial Revolution. Within days, boats waited hours to transit into the cold, blue waters of Earth's second largest lake. The Lake Superior Route was born.

The Forest City: Hub of the Northern Frontier

Beginning with the opening of the Eerie Canal in 1825, Cleveland quickly rose in population and opportunity as an industrial boomtown. Its position on the south shore of Lake Eerie made Cleveland a common stopping port for vessels traveling from the upper lakes to Buffalo. Coupled with the expansion of the Cleveland, Columbus & Cincinnati Railroad, the Forest City became the hub for minerals mined from Lake Superior, and coal from the south, (Martin 1999:1). Cleveland built grain elevators, docks, and warehouses to meet the high demands (Blume 2011:109).

Cleveland's stronghold on the Lake Superior mineral industry attracted investors, merchants, boat owners, captains, and shipbuilders who worked the Lake Superior Route. From 1840 to 1870, Cleveland was the leading shipbuilding port on the Lakes (Martin 1999:33). By 1860, most wooden propellers were built in Buffalo and Cleveland (Gardiner 1990). Peck and Masters were two leading Cleveland shipbuilders who had a reputation for strong, experimental designs in both sail and steam. After working for Luther Moses, Elihu Peck and Irvine Masters established their own yard on west side of the Cuyahoga and built sixteen schooners, three barks,

and four propellers in their first three years (1855-1858) (Wright and Martin 1999:42). As mayor of Cleveland, Irvine Masters wielded political and financial power that fostered Peck's ability to experiment in ship design (Ellis 1998:239). They built fifty ships in the first ten years of operation (1854-1864) and launched *Pewabic* in October of 1863 (Encyclopedia of Cleveland History 1997). Even though Peck and Masters specialized in wooden propellers for the Lake Superior Route, they still built canal schooners, barks, tugs, and barges that were common sights on the lakes. But it was their innovation in wooden shipbuilding that won their fame.

The firm was known for its unconventionality, many of their hulls were built on speculation (without a contracted buyer). *RJ Hackett* was the first bulk freighter built on the lakes, a revolutionary vessel type that remained dominant after its completion in 1869. *RJ Hackett* was built for the Lake Superior iron ore trade, with long, unobstructed decks, and open holds. Another innovation credited to Elihu Peck is the barge-consort system, when a barge is towed behind a steamer in the iron ore trade (Martin 1993:44). Though common on the lakes, this practice increased profits exponentially on the long runs north to the Lake Superior mineral districts. While the historical significance of *RJ Hackett* on Great Lakes shipbuilding is unmatched, it was the wooden passenger/package freight propellers that were most responsible for the development of Lake Superior in the middle nineteenth century.

These vessels were both the arteries, and veins of the Lake Superior Route. They delivered people and supplies and returned with mineral wealth. Naturally, Cleveland shipbuilding firms built most of the passenger/package freight propellers in the 1860s. Between 1862-1864, Peck and Masters built six in their yard alone: *Toledo* (1862), *Idaho* (1863), *Meteor* (1863), *Pewabic* (1863), *Arctic* (1864), and *Pacific* (1864). Their activity during the Civil War was unique, however. According to an article in *The Cleveland Leader* on 7 August 1865,

"Shipbuilding has been dull here for a long time. Aside from the two revenue cutters being built by E.M. Peck & Co. for the Government, there has been one large tug constructed by Quayle and Martin."

"One of the Finest on the Lakes"

Pewabic was built in 1863 to meet the demands of the excursion passenger and Keweenaw copper industries. Its construction reflects innovative strategies to be able to profit from both tourist dollars and package freight (Figure 8).

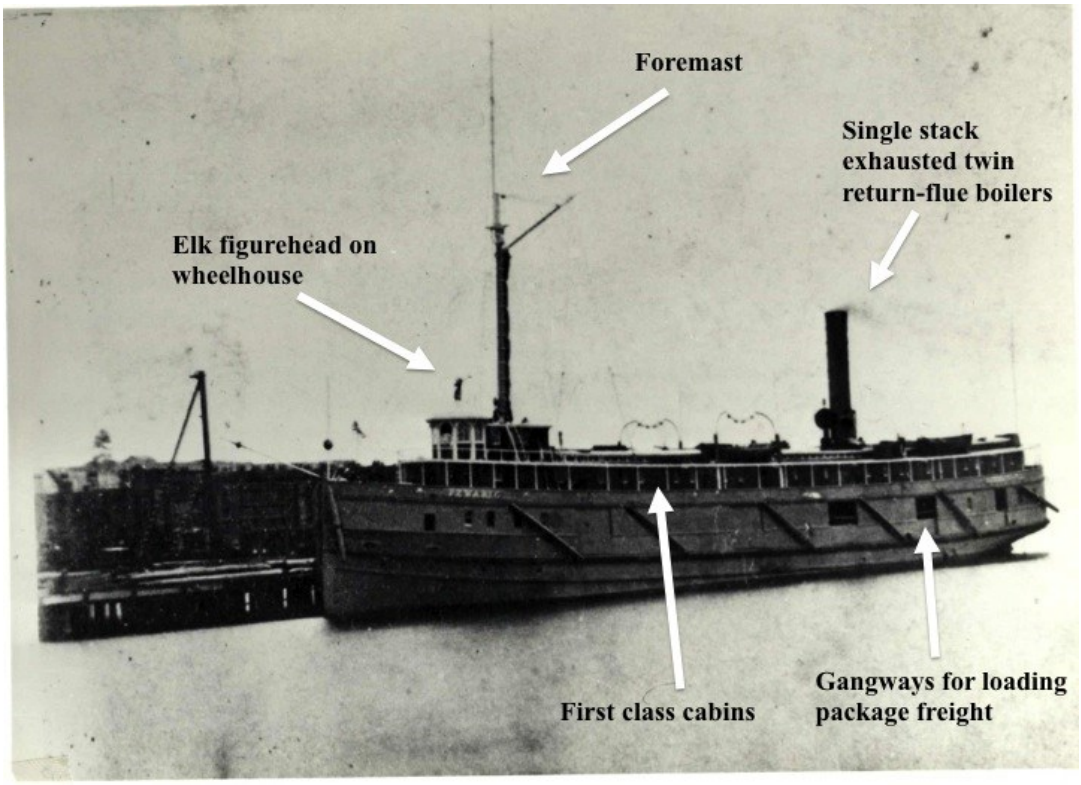


FIGURE 8. Annotated photograph of *Pewabic*. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

Valued at $100,000, *Pewabic* was 200.25 feet long, 31 feet in beam, had a depth of hold of 12.5 feet and 979 gross tons (Busch 1975). *Pewabic*'s 6.4:1 length to beam ratio allowed it to

complete the 1000-1500 mile trip in the advertised ten days (Pioneer Lake Superior Transportation Company 1865).

Local white oak's durability and strength made it the material of choice for most middle nineteenth century Great Lake vessels. Contemporary Great Lakes shipbuilders had experimented with iron hulls (*Merchant* 1862), but white oak's availability and low price allowed it to compete with iron into the late nineteenth century (Dayton 1925). *Pewabic*'s hull and centerline arch were both built of white oak. Above decks, the pilot house, first class cabins, kitchen and saloon were constructed from white pine, ideal for structures not in contact with water.

Peck and Master's utilization of white pine for cabins improved *Pewabic* in two ways. First, it brought overall cost down. In 1864, white pine was twenty seven percent cheaper than white oak due to its rapid regeneration and ability to grow in a wide range of soils (Seymour 1864). Second, it lightened the upper decks and interior of the vessel. When applied to lumber, specific gravity is density of the wood. Though not as strong as white oak, pine has its advantages. White pine's major payoff is its workability; it can be easily shaped and excellent for interior use. It was well suited for cabins that simply needed to be aesthetically pleasing to attract passengers.

Many passenger/package freight propellers had their aging cabins removed late in their careers and converted to barges (Labadie 1989; Gray 1998:37). The first class amenities and cabins were the final parts of *Pewabic*'s construction, and delayed its launch until the spring of 1864. The cabins featured skylights, stained glass windows, marble tabletops, silver tableware, and ornate woodwork.

According to a survivor account, aft of the pilothouse was a smoking room for gentlemen, and then the large hall flanked by first class staterooms. The main hall served several functions. First class passengers ate their meals here, and, when the tables were cleared, were entertained by live music and dancing. The kitchen was located aft of the great hall, and proceeded by the aft saloon. The aft saloon was open to both sexes, and a popular socializing location during cocktail hour (Russell 1892). The aft saloon exited onto the open promenade deck that wrapped around the vessel. The fantail stern and foredeck were the two most popular outdoor locations. Steerage passengers, package freight, engines, boilers, and the four hand flushing toilets were located beneath the promenade on the main deck. Beneath the main deck was the hold, where *Pewabic*'s propeller assemblies, bilge pumps, and bulk cargo were located.

Messenger (Figure 9) was one such vessel, built by Peck and Masters in 1866, and privately owned until the Michigan Central Railroad chartered it in 1872 (Thunder Bay Sanctuary Research Collection: Messenger).

FIGURE 9. *Messenger* caught in ice. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

Congress (1861) was another Peck and Master's boat that had a single screw and a centerline arch. After its first year, *Congress* was enrolled in Detroit and ran package freight between Chicago and Goderich, Ontario for the Buffalo and Lake Huron Railroad Company (Thunder Bay Sanctuary Research Collection: Detroit). The wrecks of both *Congress* and *Messenger* are located within miles of *Pewabic*. It is probable that if *Pewabic* had a longer career, it would have likely been chartered by a competing railroad.

John Baptiste Martel was a Saugatuck, Michigan shipbuilder who built passenger/package freight propellers similar in design to *Pewabic* in the 1880s. *Pewabic* (1863) and *Douglas* (1882) share striking similarities in cabin layout, gangways, single stack, and forward mast (Great Lakes Maritime Database 2012)(Figure 10).

FIGURE 10. *Douglas* at dock. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

The biggest difference between the two is size: *Douglas* was only 120.2' in length, and may not have required a supportive arch down its keelson (Great Lakes Maritime Database 2012). Notice the cargo barrels on the dock waiting to be loaded in Figure 10.

Saugatuck is another Martel passenger/package propeller similar to *Pewabic* in function and design, but smaller in dimension (Figure 11). The single screw was finished in 1887 and spent its forty-four year career plying Lake Michigan under charter for various private freight companies (Thunder Bay Sanctuary Research Collection:Saugatuck). While *Douglas* and *Saugatuck* appear to be smaller versions of *Pewabic*, there was no relation between Peck and Masters and John Baptiste Martel (Marlo Broad 2013, pers. comm.).

FIGURE 11. *Saugatuck* with full load of first class and steerage passengers. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

The most similar passenger/package freight propeller to *Pewabic* is *Globe* (1846), a 144' wooden twin screw with a centerline arch (Thunder Bay Sanctuary Research Collection:Globe). *Globe* was also propelled by direct acting, high-pressure engines built by Cuyahoga Ironworks.

But the similarities were more than structural: *Globe* was sold to Sheldon McKnight, a founding partner of the Pioneer Lake Superior Line on 10 April 1853 (Thunder Bay Sanctuary Research Collection: Globe). *Globe* made weekly trips to Sault Ste. Marie carrying package freight and passengers upbound, and copper and iron ore downbound (Figure 12). Despite its short two-year career under McKnight's ownership, *Globe* may have been the early inspiration for *Pewabic*.

FIGURE 12. *Globe* with exposed centerline arch. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

After leaving Detroit, *Pewabic* would call at Port Sarnia, Marquette, Hancock, Houghton, Copper Harbor, Eagle Harbor, Eagle River, Ontonagon, and Isle Royale (Pioneer Lake Superior Transportation Company 1865). While passengers were on shore, crewmembers would be busy provisioning and loading copper by wheelbarrow through the five gangways on each side of the vessel (Figure 13).

FIGURE 13. Copper was still loaded by hand into the twentieth century. (Courtesy of the Michigan Tech Archives, Houghton, MI.)

Passenger cabins above decks made bulk cargo loading virtually impossible, so freight had to be loaded through the gangways. The gangways inadvertently determined what type of cargo passenger/freight propellers could carry, and how it was to be loaded. Crews were restricted to wheelbarrows and handcarts, so cargo was packaged to be handled by a few men (Thompson 2000:31). *Pewabic*'s final cargo emphasizes the gangways' role in determining what type of cargo *Pewabic* would carry (Table 2).

Description	Weight (lbs)
48 Cakes Isle Royale Copper	**7,387**
Quincy Mine Barrel Copper	**41,400**
Hancock Mine Barrel Copper	**9,109**
Pewabic Mine Barrel Copper	**53,600**
Franklin Mine Ingot Copper	**32,200**
Iron Ore	**350,000**
200 Ship Knees	**----------**
250 Half Barrels of Fish	**----------**
27 Rolls of Leather	**----------**
Miscellaneous Freight	**20,000**
TOTAL	**513,696**

TABLE 2. *Pewabic*'s cargo on final voyage. (Table by Author, 2014.)

The 350,000 pounds of iron ore is the only exception. Most iron ore was carried by canallers or grain schooners who met transportation demands until the onset of the Civil War when a sharp increase in demand required non-traditional ore carriers, like *Pewabic*, to assist in transporting ore to urban centers (Thompson 2000:32).

Pewabic's Final Voyage

On its final voyage *Pewabic* carried a crew of seventeen: Captain, 1st and 2nd Mates, two engineers, cook, two porters, greaser, chambermaid, steward, clerk, bartender, deckhand, wheelman and a lookout (*New York Times* 1865). The short distances between the small, shallow ports on Lake Superior demanded vigilance and constant movement from the crew. While underway, crew members tended to the engines and entertained the first class passengers in the

two salons. Steerage passengers resided on the main deck, and rarely interacted with those in first class. They slept, cooked, and recreated below decks for the majority of the voyage.

The band was playing in the main salon as *Pewabic* departed Houghton at 11:00 AM on August 8 with a content crowd and a full hold (Dismond 1897). Numerous witness accounts describe the downbound voyage as enjoyable with favorable conditions and six miles of visibility (*Eerie Daily Dispatch* 1865a). While downbound on Lake Huron, *Pewabic* spotted the other Pioneer Lake Superior Line propeller, *Meteor*, off Thunder Bay Island. Meteor had left Cleveland two days prior (Cleveland Morning Leader 1865a). *Pewabic* and *Meteor* operated on reciprocal schedules. *Meteor* departed from Cleveland on the first and third Mondays, and *Pewabic* departed Cleveland on the second and fourth Mondays. The alternating schedule was designed to fill cabins and prevent congestion in Superior ports (Pioneer Lake Superior Transportation Company 1865).

At this time, it was not unheard of for ships of the same line to exchange mail, news, and messages. As the Civil War had ended just four months prior, passengers on board *Pewabic* were excited to read the news of the past week. Upbound passengers onboard *Meteor* looked forward to reading about current conditions in their Superior destinations. Though the reasons are not clear, it is known that *Pewabic* had prior open water rendezvouses at other locations along the Lake Superior Route. At the time of the *Meteor* and *Pewabic* rendezvous, however, both captains were off-duty and not in the wheelhouse.

George Cleveland, First Mate of *Pewabic*, could not discern *Meteor*'s signals or intent of direction. As they closed within a few lengths, *Pewabic* suddenly turned hard to starboard and *Meteor* struck *Pewabic* just beneath the wheelhouse. Mate Byron Mills of *Meteor* had no time to react and *Pewabic* sunk in less than five minutes with its cargo, passengers and manifest. There

was no manifest shore copy for *Pewabic*'s final voyage, and contemporary media sources have reported the fatality count between 50 and 125, but the most accurate, and descriptive list of passengers and crew known to be lost is 33 (*Eerie Daily Dispatch* 8/12/1865). To add to the confusion, tickets sold by Pioneer Lake Superior Transportation Company were valid on either boat (Cleveland Plain Dealer 1865). The only list of fatalities comes from an *Eerie Daily Dispatch* article published on 12 August 1865, three days after the accident. In it lists the names and hometowns of passengers and crew known to be lost and saved. According to the article, by 12 August, six crewmen and twenty-two passengers were known to be lost (Eerie Daily Dispatch 1865a).

The news devastated Cleveland, and the offices of agents Garretson and Whiting were nearly overrun by relatives of passengers desperate for answers. JT Whiting's press release on 11 August 1865 added to the despair:

> H. Garretson & Co.: Detroit, August 11.
>
> The Pewabic was sunk in Lake Huron, Wednesday evening, by a collision with the Meteor. The boat and cargo is a total loss. About seventy-five lives were lost, including Jackson, the engineer, and wife; no other acquaintance of yours, as we know.
>
> J.T. Whiting & Co. (Cleveland Morning Leader 1865b)

George Cleveland was ultimately held responsible and charged with manslaughter for what is now known as Lake Huron's worst maritime disaster (Eerie Daily Dispatch 1865a).

Many reports support the theory that the two J.T. Whiting ships were intent on trading news, except for an account written by a wheelsman on board *Meteor*, Mr. McGillivray:

> The story that the two vessels had approached each other to exchange newspapers is untrue. Mr. McGillivray says no such

> maneuver was thought of, or attempted. The lookout on the *Meteor* was not at his post, Mr. McGillivray says, but was in the cabin listening to the music and watching the dancing. The lookout on the *Pewabic* was drunk, Mr. McGillivray says, he thinks from the way the *Pewabic* was steered, that her wheelsman may not have been neglected when the refreshments were dealt out (*Duluth Evening Herald* 1897).

The favorable conditions at the time of the collision led to much controversy over the incident. Both stories that the ships were exchanging mail and that *Pewabic*'s wheelsman was drunk, are equally difficult to believe. More likely, there was confusion in passing signals and George Cleveland was ordered to turn to starboard when he meant port, or the engineer misinterpreted the call. At this time, a port turn of the steering wheel brought the propeller to starboard, and vice versa. It is a reasonable proposition that Cleveland mistakenly turned the wheel to port, which crossed *Pewabic* into the path of *Meteor*. Regardless, the sighting of *Meteor* should have come to no surprise to the crew of *Pewabic*. The two vessels had passed each other just seven days prior, only a few miles north of Thunder Bay Island (Atwood 1865). Cleveland was ultimately acquitted of all charges (Russell 1917).

The tremendous loss of life and property has given way to alternate theories of the incident. Some have argued that the captains steered close to show off their respective ship to the other in a display of power and confidence in their vessel and skill (Daily Mining Gazette 1975). Mark Thompson (2000:350) coined this persona "cowboy captain" and they were plentiful on the lakes during the 1860s: "in the graveyard of the lakes, it is the captains who have been the grim reapers". These macho captains are characterized by their willingness to challenge weather and disregard safety for speed. The heritage and later career of George McKay suggests that the twenty-seven year old *Pewabic* captain was not trying to boast when the collision occurred. His father, John McKay, captained *Commodore Perry*, on whose deck George was born (Yates

1969:1). Despite the *Pewabic* disaster, George McKay remained prominent and well respected in the shipping community. He managed the large Cleveland Transportation Company Fleet and was a founding member and the first treasurer of the Lake Carriers' Association (Semones 2007). McKay's maritime upbringing and professional associations with first rate shipping companies help defeat claims against his competency as a captain.

Even more outlandish is the theory that the rendezvous was planned so that prostitutes attending to Mackinaw soldiers would not be onboard as soldiers' wives and families awaited their return in Detroit (Wayne Lusardi 2012, pers. comm.). The prostitute theory can be discounted by the fact that most on board were excursion passengers, and would have noticed, and probably complained.

Archaeology of Pewabic

Many of the features unique to *Pewabic* are not revealed on the lone historic photo. Beneath the main deck, two high-pressure, 26.5 x 30" Cuyahoga engines gave the passenger/package freight propeller an average speed of eleven and half miles an hour (Croneweth 1897a). Each propeller spun eighty six times per minute (Historical Collection of the Great Lakes 1860s). The engines were inverted, single cylinder, single crank, vertical direct action and manufactured by Cuyahoga Iron Furnace Works in Cleveland (Figure 14). Oak planking insulated the cylinders (Out of the Blue Productions 2003). The vertical configuration was most desirable for merchant ships because it was more space efficient than contemporary horizontal arrangements (Clark 1862).

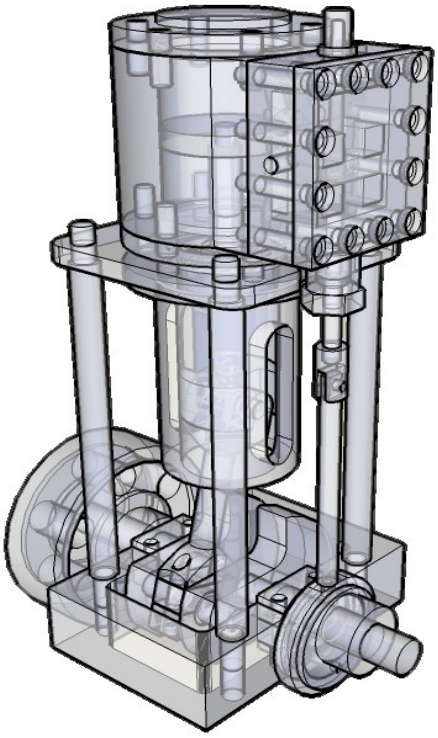


FIGURE 14. Engine similar to the Cuyahogas on *Pewabic*. (Courtesy of Smitty's Blog).

Two 8 x 20' return flue boilers with 3/8" iron plating fed the engines and exhaust was funneled through a gather that led to the single smokestack over the centerline arch. The boilers had a diameter of eight feet and produced 72 pounds of pressure (Historical Collection of the Great Lakes 1860s). *Pewabic*'s prominent features and state of preservation can be seen in a side-by-side comparison of side scan sonar, a photo mosaic and a site plan. *Pewabic*'s 6.4:1 length to beam ratio is exceptionally clear in the side scan sonar image shot at 100 khz with 100m range (Figure 15). Note its sharp, dagger bow, prevalent centerline arch, the vertical relief on the boiler heads, and fantail stern. A site plan (Figure 16) has been generated from a photo mosaic (Figure 17). The photo mosaic illustrates finer details of *Pewabic*'s wreck site. Note the deck coaming aft of the cylinders. The engine room structure terminated at this line. The solitary midship hatch granted access to the fire room, and to the hold.

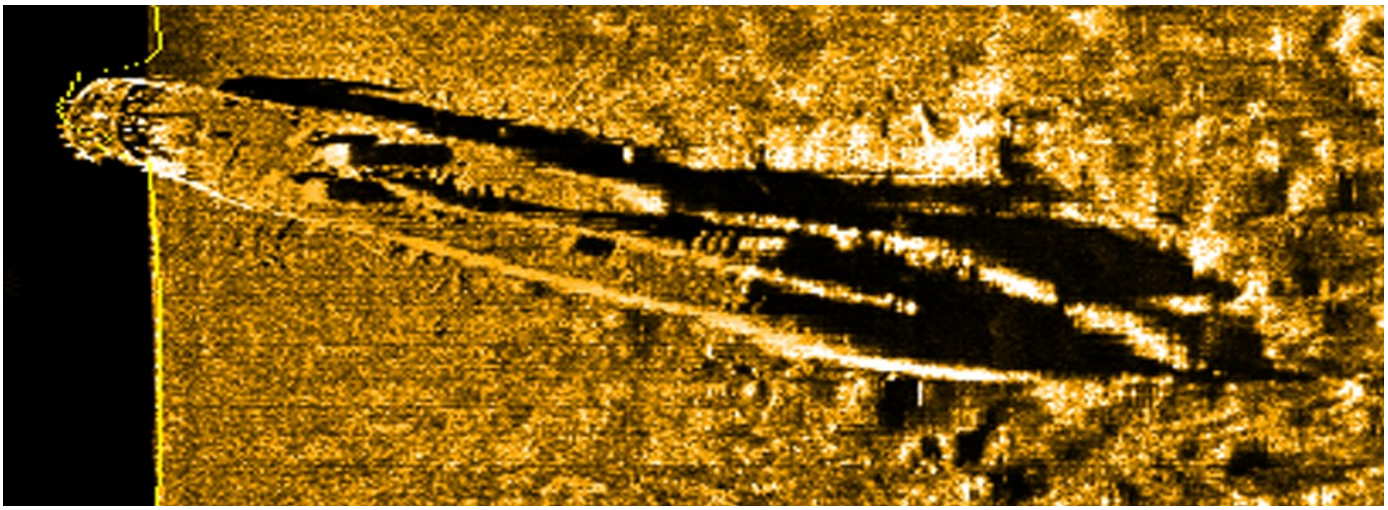


FIGURE 15. Side scan sonar image of *Pewabic*. (Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

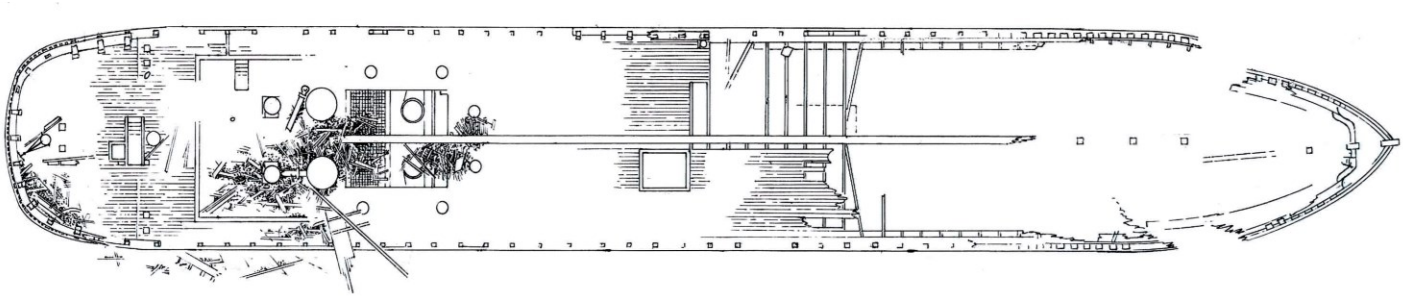


FIGURE 16. Site plan. (Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

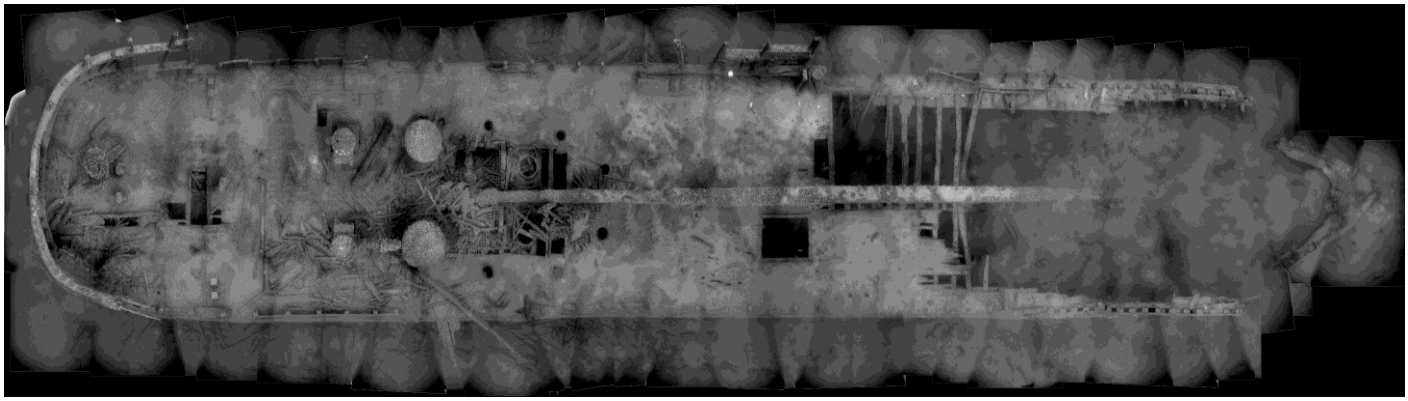


FIGURE 17. Photo mosaic. (Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

The two propeller shafts entered the hull through stuffing boxes: wood casings that keep the shafts aligned and rigid (Figure 18). The stuffing boxes were well oiled to keep the shafts spinning with minimal lateral movement and reduced friction. The stuffing boxes on *Pewabic*'s propeller shafts extend one foot aft of the hull. Though *Pewabic* was never docked for repairs in its short career, its two stuffing boxes were likely failure points. Under immense friction and heat generated by the propeller shafts, stuffing boxes were notorious as "the most prejudicial, most frequent, and most difficult [problems] to repair". Such was the case with the early passenger/package propeller *Indiana* which sunk in 1858 in Lake Superior after its propeller shaft snapped the stern post due to a broken stuffing box (Robinson 1999:2).

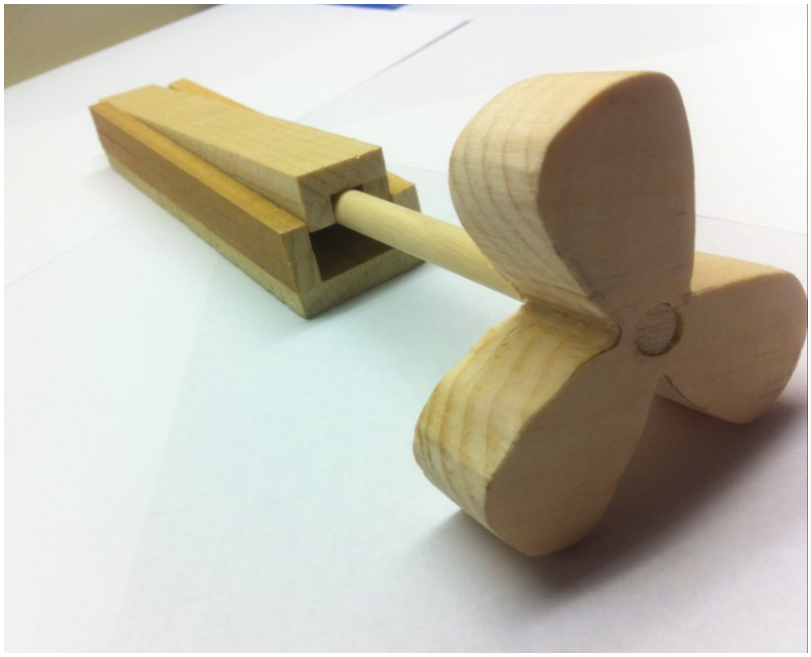


FIGURE 18. Stuffing box model. (Photo/Model by Author, 2012.)

The square-blade, 8.5 foot diameter "Loper" propellers of *Pewabic* are not well protected when compared to many contemporary single screws whose propeller was well guarded under

center of the stern. Single screws also had the advantage of the rudder placed directly aft and in line with the propeller. Single screw propeller shafts were bored directly through the sternpost and deadwood, strong stern timbers that increased shaft stability. *Pewabic*'s twin propellers are reinforced by a vertical strut on the aft face of the propeller hub that is anchored above, through the outer hull into deadwood, and also by an iron horizontal strut that is secured forward of the rudder. The strut braces form two "Ls" facing each other and are secured at the propeller hubs (Figure 19). As noted, *Pewabic*'s propellers are notably more exposed than contemporary single screws. Coupled with the need for additional reinforcement, twin screws made little impact on Great Lakes shipbuilding until the advent of the steel hull, which could harness shaft vibration.

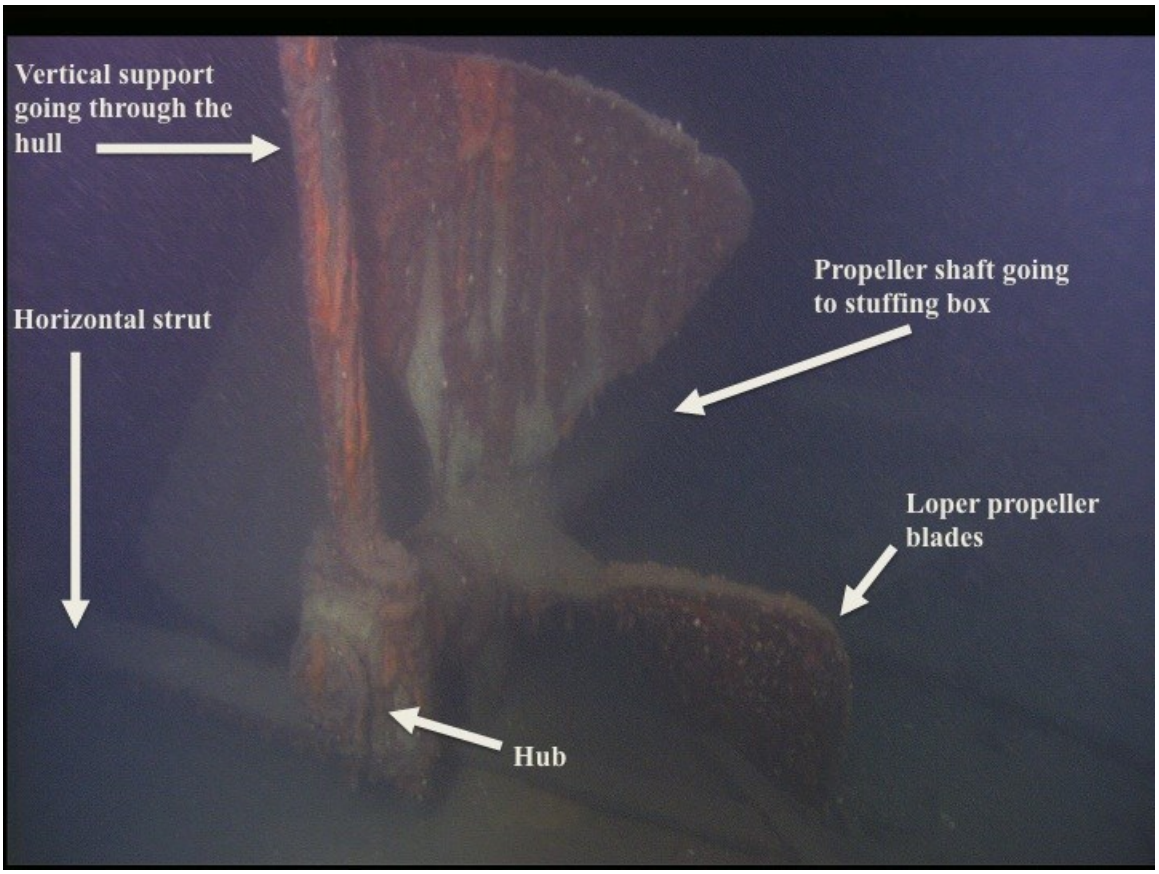


FIGURE 19. *Pewabic*'s starboard propeller. (Photo Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

However, twin screws had several advantages over contemporary single screws. First, the propellers were smaller, and lighter. Their size reduced draught and gave twin screw vessels access to smaller, less established ports (Maw and Dredge 1879). This feature was especially advantageous for *Pewabic* which visited remote ports on Lake Superior. *Pewabic* drafted eight feet forward and nine and half feet aft when loaded with eighty tons of coal and four hundred tons of freight (Historical Collection of the Great Lakes 1860s).

Second, *Pewabic*'s twin screws were exactly that: twin. *Pewabic* could still operate if one of its engines failed. The twin-screw configuration was an onboard insurance plan that made northern voyages safer for both passengers and valuable package freight. Third, twin screws were thought to be faster than single screws until this assumption was refuted in the 1880s when marine engineers compared disc area per horsepower of single screws to twins (Maw and Dredge 1879). Lastly, twin screws offered steering support to the rudder and reduced *Pewabic*'s turning radius (Burgh 1865). *Pewabic* needed a tight turn radius to navigate the narrows at Portage Lake and the locks at Sault Ste. Marie. These four advantages suited vessels on the Lake Superior Route well. Nevertheless, twin screws were not well understood by 1863, and carried their fair share of disadvantages.

First, twin propulsion systems required twice the maintenance, equipment, and fuel. They also cost more to build than a single screw. Second, twin screws required boring two orifices through the hull, in areas of the stern that had minimal deadwood. Single screws had the advantage of exiting the hull once, through sturdy deadwood that reduced shaft movement. Third, twin screws had a greatly reduced disc area. *Pewabic*'s two propellers were 8.5' in diameter. After comparing representative vessels of like size, naval engineers Maw and Dredge

wrote: “These facts make it surprising perhaps that the single and twin-screw ship performances alluded to come out so nearly equal as they did” (Maw and Dredge 1879).

Despite the validity of these criticisms, the twin-screw configuration was appropriate for *Pewabic*’s mission: get to the isolated ports in Lake Superior, and fast. The shear fact that *Pewabic* needed a shallow draught to enter Portage Lake, Copper Harbor, Ontonagon, and other primitive harbors was probably enough reason to outfit the steamer with twin screws. Coupled with the aid to steering in narrow passages, *Pewabic* was the ideal platform for twin-screw application in a passenger/package freight propeller.

Despite its redundant steam machinery, *Pewabic* was also outfitted with a secondary propulsion system: a fore and aft-rigged foremast with a jib. This shipbuilding practice lasted through the last decade of the nineteenth century. The auxiliary sails often assisted with loading and unloading, conserved fuel, and was a tertiary backup in case of mechanical failure in both engines (Bowlus 2010:43). The foremast was stepped just aft of the wheelhouse. Unfortunately, this section of *Pewabic*’s hull was dynamited during a 1917 salvage operation. The only source available that corresponds to *Pewabic*’s auxiliary sail is the lone historic image of the propeller afloat.

A common problem in wooden steamboats was bow and stern “hogging”, or drooping due to the weight of propulsion machinery. The fast-pumping high-pressure engines and twin shaft assemblies also generated substantial vibration in the hull and mandated stem-to-stern reinforcement. Beginning on the Hudson River steamboat *North America* (1827), shipbuilders employed long trusses that maintained hull rigidity in wooden steamboats (Robinson 1999).

Pewabic was outfitted with a rare centerline arch that stiffened the boat along the keelson (Figure 20). The arch was attached directly to the keelson by wood stanchions and iron rods

(Figure 21). Twin side arches were much more common during this time, as seen on *Meteor* (Barry 1973:79)(Figure 22). Some passenger/package freight propellers had arches built into their ceiling (see Gray 1998).

FIGURE 20. Photo mosaic of *Pewabic*'s centerline arch. (Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

FIGURE 21. Arch detail. (Courtesy of the National Oceanic and Atmospheric Administration, 2005.)

The centerline arch was most likely an innovative addition that satisfied the need for structural reinforcing made possible because of the location of the twins screw machinery, but remained hidden from passenger views, thereby enhancing *Pewabic*'s aesthetic appeal (Bradley Rodgers 2014, pers. comm.). Further, *Pewabic* was lighter with one arch than two. The

combination of twin screws and the centerline arch made *Pewabic* an especially unique passenger/package freight propeller; most contemporary examples with the centerline arch were outfitted with a single direct acting engine.

FIGURE 22. *Meteor* at dock. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

Conclusion

The *Pewabic* disaster sparked reactions across the country. Five years later, the Committee on Commerce reviewed a draft of the "Security of Life on Steam Vessels" Bill that mandated every captain engaged in passenger travel keep a detailed travel log, two copies of the vessel's manifest, and ensure space on life rafts for each person. The bill also heightened penalties for negligent captains and increased criteria for mandatory steamboat inspections.

Even *Pewabic*'s tragic wrecking event embodies the zeitgeist of the Great Lakes during the middle nineteenth century: speed, profit, and expansion into new areas ripe for resource harvest. Wooden passenger/package freight propellers prided themselves as elegant movers of both man and material. In the specific case of *Pewabic* and other Peck and Masters' propellers, they connected the isolated Keweenaw Peninsula with America's urban centers. From its five gangways to its elegant cabins above decks, *Pewabic* was constructed specifically for the Lake Superior Route. With a 6.4:1 length to beam ratio, twin high-pressure engines and a centerline arch to keep the hull together, *Pewabic* pushed wooden ship technology to its very limits with the story of the Keweenaw fastened to every frame.

CHAPTER FOUR: FROM SALVAGE TARGET TO SHIPWRECK CELEBRITY – THE MANAGEMENT HISTORY OF *PEWABIC*

Introduction

Pewabic's wrecking event spurred immediate reactions from passenger relatives, insurance companies, and mining companies. Even after *Pewabic*'s first mate George Cleveland was acquitted of all charges, accusations and survivor stories made news headlines from the *Sacramento Daily Union* to the *New York Times*. However the plights of survivors and the tragic loss of life were not the only stories making headlines; the valuable copper cargo had not been forgotten. Within weeks, salvagers were an everyday sight in the small logging town of Alpena. They had come from far and wide, determined to retrieve the red metal that lay twenty-eight fathoms deep, in the hold of "Lake Huron's Death Ship".

In 1865, salvage beyond 100 feet was dangerous and rare, but *Pewabic*, lying in 170 feet, lured risk takers to invent diving bells and armored suits to reach its cargo (Green 1859:25). *Pewabic*'s salvage was as much about the advance of underwater exploration as it was about the copper. Between 1865 and 1974 six major salvage attempts were made; two proved fruitful, but four ended in bankruptcy, and death. Busch Oceanographic Equipment Company executed the last salvage in 1974. Since then, *Pewabic* has become a Great Lakes shipwreck celebrity. It has been managed by a combination of advocate volunteers, state departments, and federal agencies. This chapter will trace *Pewabic*'s history from the days after its collision to the present including noteworthy salvage expeditions and the corresponding state and federal initiatives to protect *Pewabic* and other shipwrecks of Thunder Bay.

Who Owns Pewabic, and Does Anyone Care?

Steamers in the middle nineteenth century were commonly insured for much less than their build cost. In the case of *Pewabic*, insurance is differentiated between policies taken out on the cargo, and the policy on the vessel itself. Most secondary sources cite that multiple companies insured *Pewabic* for $60,185, but this figure actually corresponds to the total insurance value placed on the copper cargo (New York Times 1865; Walker 1955). Each mine that placed copper on board bought a separate insurance policy that insured safe delivery from Houghton, Michigan, to Detroit or Cleveland. Only two of these companies have been mentioned by name: Aetna, and Home Insurance Company. Only the records of the former have survived (*Eerie Daily Dispatch* 1865a; *Alpena News* 1974).

According to Aetna records from 1865, six policies were paid to five different mines: Quincy Manufacturing Company ($39,156 and $8,232), Isle Royale Manufacturing Company ($2,203), Ridge Copper Manufacturing Company ($3,704), Evergreen Bluff Manufacturing Company ($6,736) and Knowlton Manufacturing Company ($154)(Aetna Insurance Company 1867:505). The cumulative $60,000 of insurance taken on copper cargo is separate from the insurance policy taken on the vessel. Cargo was insured by the property owners, the mines, just as *Pewabic* was insured by JT Whiting & Company, who owned both *Pewabic* and *Meteor*. Unfortunately for Whiting, he had no insurance on *Pewabic* at the time of the disaster (Matiskella 2013:76). The loss left the Lake Superior business mogul bankrupt (Croneweth 1897b).

Because of the wreck's depth, JT Whiting probably released *Pewabic* as an abandoned vessel. While there is no official abandonment statement, the fact that salvagers were arriving in Alpena within days of the accident suggests that Whiting either permitted their intentions, or the

insurance companies with rights to the cargo bypassed Whiting entirely and contracted the salvagers without permission. This ownership case presents considerable ambiguity, and the contemporary legal course was not well defined, or understood. Both insurance companies and private groups pursued *Pewabic*, and little legal distinction distinguished one from the other. Mike Chalk, a diver who planned to salvage the wreck in 1892 remarked:

> Now as to the dispute as to who has a right to the *Pewabic*. According to the maritime law she and her cargo have been outlawed for the past seventeen years, so that they belong to nobody. The moment anyone succeeds in raising her that person becomes the owner. So I'm not worried on that score (Duluth Daily News 1892).

Chalk remarks that *Pewabic* has been outlawed, or abandoned, since 1875, but there is no official record of Whiting releasing *Pewabic.* However, it is more likely that Whiting officially released his rights to the vessel as a total loss, because there is no evidence of vessel insurance. Regardless, Whiting's right to the hull did not seem to delay action by insurance companies who owned the cargo. Billy Pike was a famous diver who had previously dove to two hundred feet, and was Home Insurance Company's first choice for the job (Eerie Daily Dispatch 1865c).

The Curse of the Copper

In 1865, hardhats were standard equipment for marine salvage projects (Alpena News 1974a). Pike employed the surface-supplied system on board *Magnet*, Home Insurance Company's wrecker that had conducted previous successful salvages of total losses in the Great Lakes (Busch 1975:37). Pike's target was a safe that contained "an immense amount of money belonging to the Express Companies, commercial men, and passengers" (Eerie Daily Dispatch 1865c). *Magnet* hooked the wreck, and Pike made the first descent to *Pewabic*.

During the dive, attendants on board *Magnet* grew increasingly alarmed when Pike did not transmit safety signals. The attendants brought the dive suit to the surface, only to find Pike's lifeless body lying limp in the suit. Reporters concluded it was a pressure-related injury (Richards 1939). Pike's historic descent deterred salvage operations until 1879 when another contractor, Captain Snow, fruitlessly searched for the wreck site (Busch 1975:38). Snow was well-know for the boiler salvage of *Congress*, another Peck and Masters propeller owned by JT Whiting that sunk within miles of *Pewabic* (Thunder Bay Sanctuary Research Collection 2013). Despite his familiarity with the Thunder Bay region, Snow was not successful in his pursuit of *Pewabic*. Snow's failure in 1879 attracted a rival outfit led by DG Aber who chartered *EM Peck*, the tug built by, and named after the builder of *Pewabic* (Busch 1975:38). Aber's efforts in 1880 were also unsuccessful.

Dozens more contracted Alpena tugs to relocate the wreck, but none attracted more attention than an expedition in 1891. Oliver Pelkey and Michael McCarty were "two of the most experienced divers in the United States" and contracted to the wrecking tug *Emerald* (Duluth Daily News 1891). Their goal was to salvage the copper cargo using Pelkey's newly patented dive suit. Pelkey designed a deep sea suit that has "sufficient strength to resist external pressures, and at the same time be of sufficient flexibility to permit the requisite movements of the diver" (Pelkey 1889:2)(Figure 23).

The suit had an inner layer of metallic armor rings, each designed to fit the contours of the torso. The helmet, torso rings, arms, legs and boots linked at joints that permitted each section to move more freely than if the suit had been constructed of one or two pieces. Pelkey installed a rubber suit over the metallic armor that was fastened flush by plates and screws that made it air and watertight (Pelkey 1889:3).

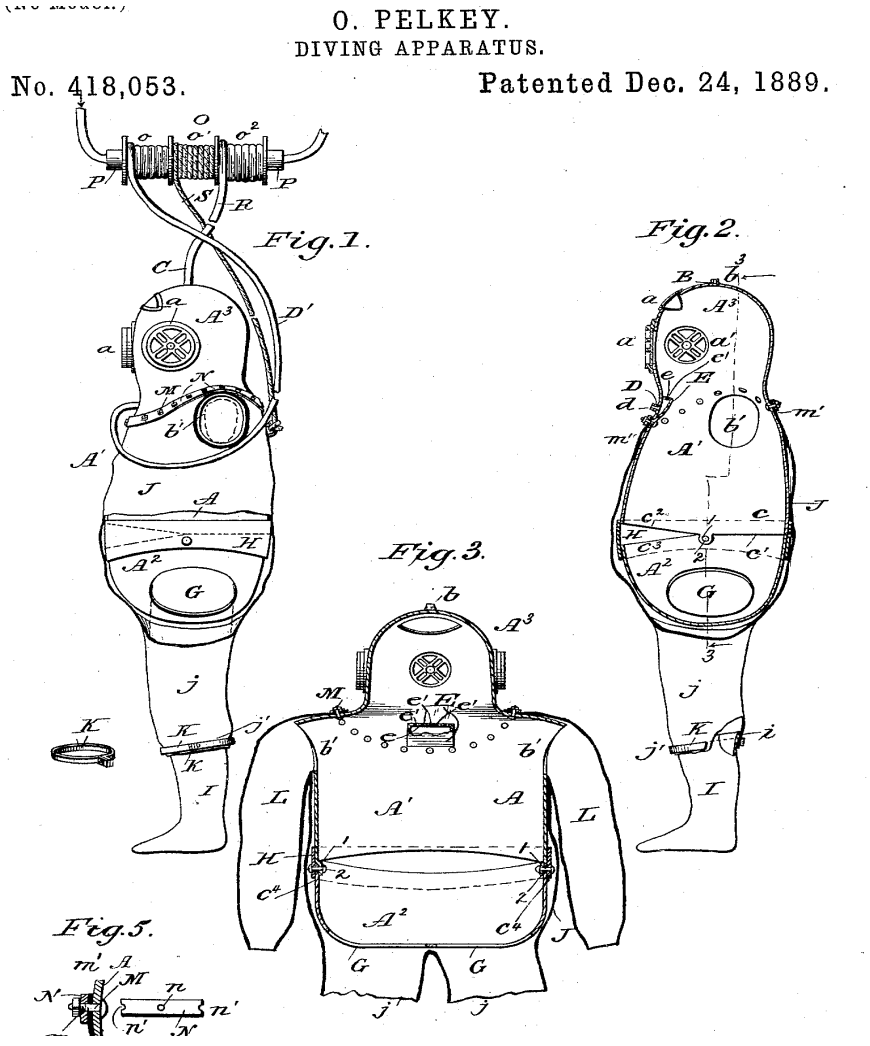


FIGURE 23. Pelkey's patent, note the torso rings *c*, *c1*, *c2*, *c3* (Pelkey 1889:1).

Pelkey chose *Pewabic* to prove his invention worthy to the diving community, while securing finances from the copper cargo to fund further development of his dive suit (Duluth Evening Herald 1891). *Emerald* was chartered by parties and investors interested in the first trials of Pelkey's invention (Alpena Weekly Argus 1892b). During Pelkey's debut he became tragically entangled:

> The signals of his assistance on the steamer *Emerald*, not being answered, an investigation discovered that he was fast. The ropes [umbilical tether] were then slackened, in hopes that the

> unfortunate diver could release himself, but after waiting a reasonable time, they tried to pull him up, but six men were unable to get him loose. The rope was then made fast to the steamer, she started ahead and the diver pulled loose. He was then hauled to the surface as fast as possible, and when released of his helmet, had yet some life, but died before he was able to relate what the trouble was. His diving suit was torn, but was probably done in pulling him loose from the obstruction (Alpena Weekly Argus 1891).

Even if Pelkey freed himself the rapid ascent would have induced pressure related injuries decompression sickness and air embolism. Unfortunately, the two fatalities did little to deter copper suitors and dive suit inventors. By the 1890s, *Pewabic* had become a salvage training ground for cutting-edge underwater technologies. It offered a chance for deep-sea inventors to test and exhibit their equipment, and potentially cash in on the copper cargo. Each failed expedition and fatality fueled the competitive fire of rival inventors, divers, and investors. Just one year after Pelkey's death, another dive suit designer arrived on scene: EH Brault brought his patented dive suit to try his luck on *Pewabic* (Alpena Weekly Argus 1892a).

The First Diver to Return Alive

Brault's two-layer dive suit was much stronger than Pelkey's torso-ring design. The torso was completely plated, and secured to the helmet. Metallic splints formed cages around the arms and legs. The inner armor was constructed of aluminum, and covered with an outer rubber suit. The assemblage weighed just twenty pounds (Alpena Weekly Argus 1892a). The most promising upgrades were 1) the incorporation of an incandescent electric lamp mounted on top of the helmet, allowing the diver to work in the dark and 2) a "speaking tube" that facilitated verbal communication between the diver and the surface that doubly served as a redundant air hose

(Brault et al. 1891:2)(Figure 24).

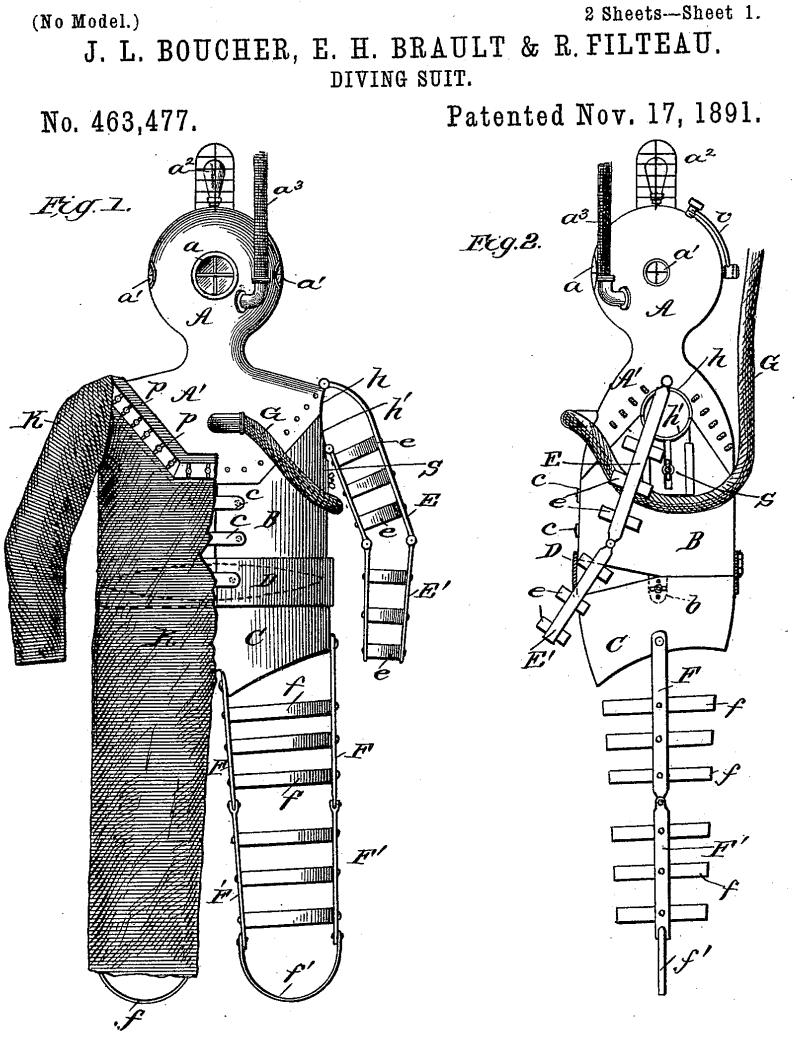


FIGURE 24. Brault's patent, note the metal splints that cage the arms and legs (Brault 1891:1).

Brault only made one dive in his suit. The inventor descended to 147 feet for 43 minutes, but came up early due to frigid temperatures and a poor air delivery system. Brault's dive marks the first successful descent to *Pewabic* with the diver returning alive (Alpena Weekly Argus 1892a). Brault did not, however, understand the physics of water pressure, "he said he experiences no trouble from the water pressure, in fact he did not feel the great pressure, as his armor prevented the water from touching any part of his body and head" (Alpena Weekly Argus

1892a). Though Brault's suit was successful, the tug *Emerald* left for another salvage job in Lake Superior before subsequent dives were conducted. Despite his eagerness to be the first to salvage *Pewabic*, he disappears from the historical record after the departure of *Emerald*.

The Bell

Even after Brault's successful descent in 1892, reaching *Pewabic* was still highly dangerous. Little knowledge existed on dive medicine, and the risks of diving *Pewabic* were further stressed with each diving fatality. While the experiences of Pike, Pelkey, and Brault did not stop salvagers, they did alter future approaches. Later attempts were better financed and had better equipment. The American Wrecking and Salvaging Company of Milwaukee arrived in Alpena in the summer of 1896 with the steambarge *HA Root* (*Alpena Weekly Argus* 1896). On board the *HA Root* was the latest invention designed to salvage *Pewabic*: Worden G. Smith's diving bell (Figure 25). The bell was 6 feet in diameter, 8 feet tall, plated with one-inch thick steel, and weighed 13,000 pounds (Figure 26). Smith installed a water chamber underneath the bell. When its seacocks were opened, the chamber would fill and keep the bell anchored to the bottom. Four adjustable iron feet operated from inside improved stability and allowed the bell to balance on uneven surfaces (Smith 1893:3). Five glass portholes of two and half-inch thickness allowed the two divers 360-degree vision and views of the two iron arms that articulated on ball and socket joints (Haltiner 1986:69).

The bell was a huge success, and proved adequate against the pressure. The only obstacle in 1896 was relocating the wreck, which Smith completed in September with the help of Captain John Persons.

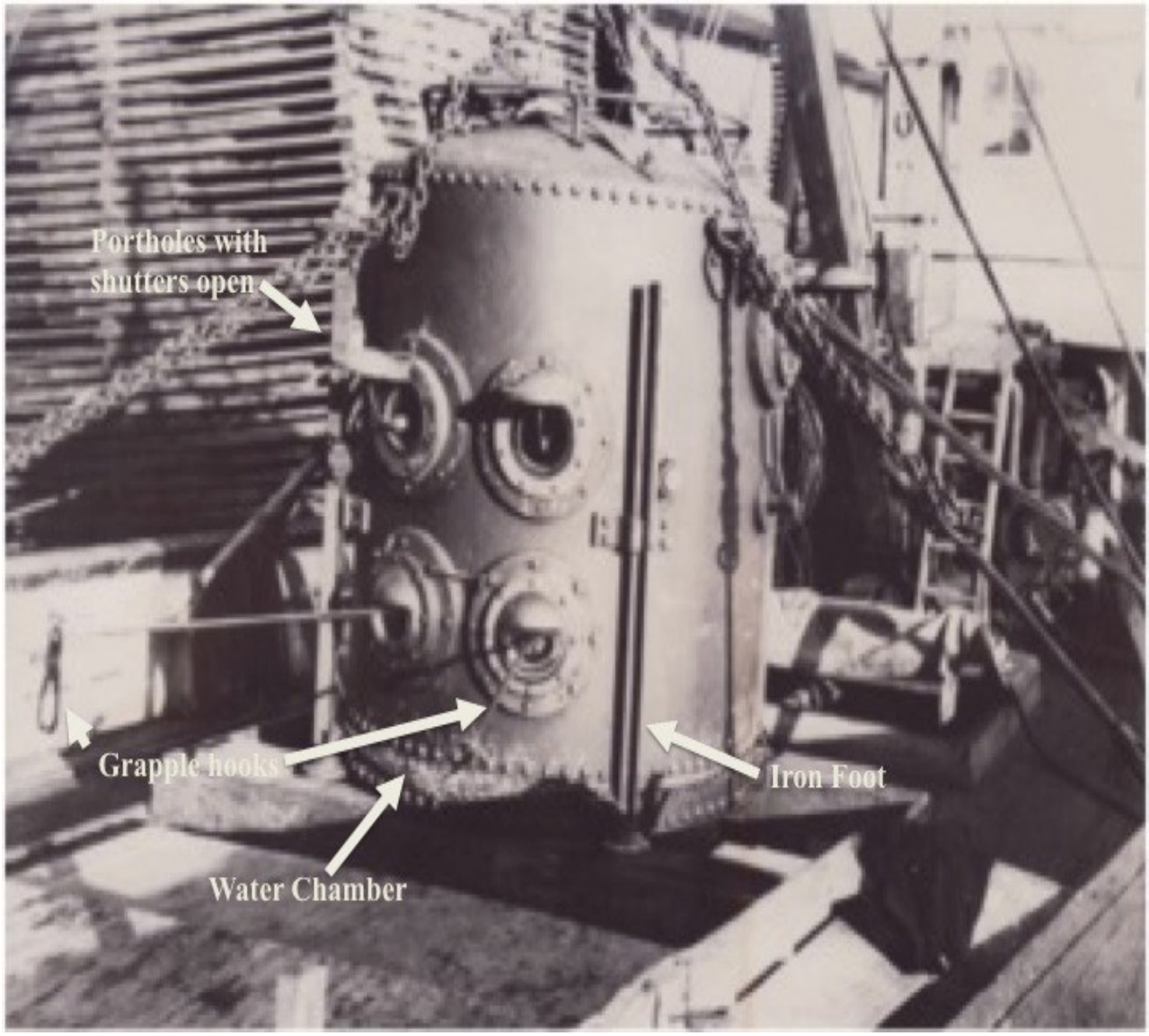


FIGURE 25. Smith's diving bell, the divers would enter through the top. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

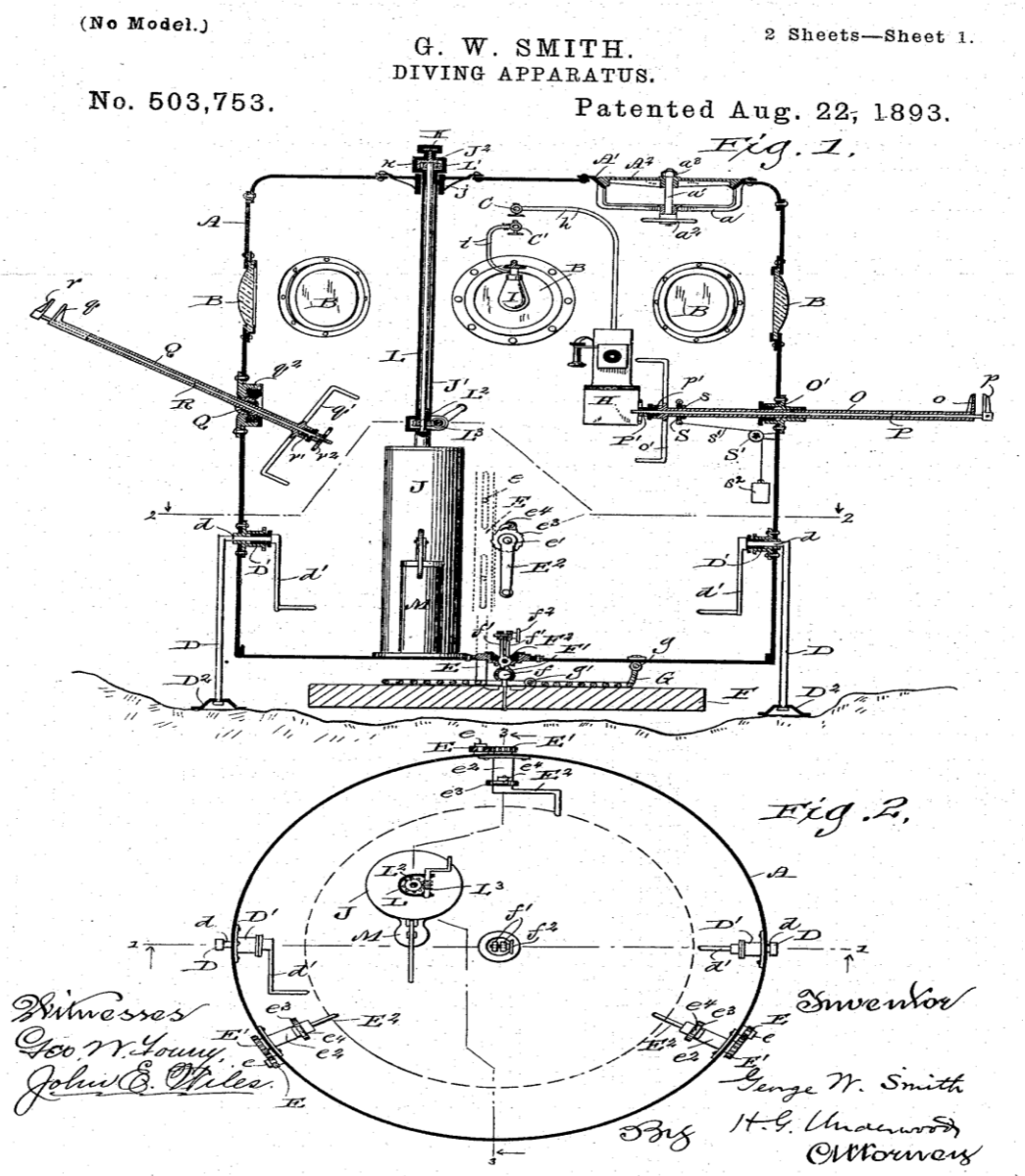


FIGURE 26. Smith's patent, note the protruding arms with grapplers at the ends. The end closest to the bell advanced and retracted along a threaded pipe, similar to a "C" clamp (Smith 1893:1).

Persons saw the collision in 1865 from the shores of Thunder Bay Island, just 6.5 miles from the site of the accident. His father was chief of the Thunder Bay Island Life Saving Station. Persons was the only witness of the collision to reveal the wreck's location to salvagers. Due to the high-value cargo, the few who had found *Pewabic* kept the information secret. After

fruitlessly dragging his bell behind the *HA Root* all summer, Smith located *Pewabic* within days of receiving Persons advice on June 8 (Kimball 1929).

Smith returned in June 1897 to begin the salvage. Smith assumed that the barrels of copper remained on the main deck, but the bow-first sinking event caused most of the cargo to crash forward. Smith's well publicized use of dynamite cleared the decking from the forward third of the ship (Busch 1975:49). J.S. Gagsden was an agent for Aetna Insurance Company, who personally viewed the demolition from inside Smith's diving bell:

> A piece of rock was lowered from the surface, and it was pushed into a position where it would hold the cable to which it was attached. Then a piece of dynamite was lowered and was placed in position in the same way. An electric wire was attached to it, and we told them to lift us up. When the dynamite was exploded the surface of the lake was greatly agitated and large numbers of lake trout were killed by the shock and soon were seen floating on the water. The men on the barge were so eager in gathering in the trout with nets that they neglected to lower us to see the big bubbles made at the bottom. When we went down the sediment was so agitated that we could see nothing (Sacramento Daily Union 1897).

The presence of Gagsden and the absence of a JT Whiting & Company representative support the fact that *Pewabic* was an abandoned vessel by 1897. Furthermore, Gagsden's participation confirms that the American Wrecking and Salvage Company was contracted by Aetna Insurance Company to recover Aetna's portion of the cargo, though the details of this partnership are missing from the historical record (*Alpena News* 1974a). This event was one of the most significant cultural processes in *Pewabic*'s site formation process.

By August of 1897, it was clear that Smith's second summer on board *HA Root* was marginally successful. The native copper pieces were the most exposed on the lake bottom, but

were also the most difficult to recover. These chunks of red metal often weigh between 1,000 and 3,000 pounds. On June 26 four freight trucks were filled with three tons of native copper, broken into only four pieces. In early July, another load of copper lay on the deck of *HA Root* along with "the governor off the engine, the main spar, and a silver dining tray" (*Alpena News* 1974a). Most of the grapple arms fitted to the bell broke in lifting attempts. In a lift on July 18, "one mass weighing several tons fell just as it reached the surface of the water, and missed the diving bell by less than a foot" (*Chicago Inter Ocean* 1897).

Unstable weather patterns drove Smith and *HA Root* back to Milwaukee on 25 September 1897. They had successfully recovered fifty tons of copper worth $11,000, the foremast, a saloon door, marble table top, a silver dining tray, smokestack and a glass bottle (Busch 1975:53). According to a *Detroit Free Press* article, Smith received $6,600 from Aetna Insurance Company (Busch 1975:53). Despite the small sum, the success of his diving bell was Smith's biggest. He had become the first suitor to make repeated dives to *Pewabic*, and to raise parts of its cargo. The triumphs of the bell, and the remaining two hundred tons of copper brought Smith back to Alpena on 7 June 1898 for the third summer of salvage operations *(Alpena Weekly Argus* 1898a).

The 1898 expedition was under the leadership of George S. Campbell, financial investor, and early backer of Smith's diving bell. Stockholders believed that Campbell could finish the job quicker and facilitate larger investment returns (Busch 1975:54). Campbell took lead, and hastened all processes to satisfy investors. Campbell's bold approach sealed the fate for the company, and himself:

On Saturday the bell was lowered and worked good until the afternoon when the crew received orders to pull the bell up immediately. A window had cracked and a fine spray of water hit Campbell on the back of the neck. Campbell and the Indian diver, Adam Kicisch, were in the bell. Once on deck a new window was installed and Campbell announced that he was going back down. Since the shutters were not installed, Captain Phelps remonstrated Campbell about going down without them. Campbell merely laughed and said it was perfectly safe, that he had worked all last summer without shutters. At 11:00 AM the second descent was made with Campbell and a sailor named Pedar Olson in the bell. The Indian diver had refused to go down and Olson had asked many times to be allowed to go down. Everything, including the telephone, was working fine so the deck crew relaxed. After a short time, Campbell asked to be lowered about six inches, which was done, and when asked if everything was all right there was no answer. At about the same time, Peter Vroldsen discovered that bubbles were coming up. Captain Phelps ordered the bell to be hoisted up immediately. The machinery was started up and the bell was found to be fouled in the wreck and could not be moved. The derrick was strained to its utmost and was broken, but still the bell remained solid. Extra lashings were placed around the derrick and the boat was moved backwards and forwards over the wreck, but not until 5 PM were the efforts of the crew successful in disengaging the bell from the wreck. A heavy sea was running by that time and with a broken derrick, and the bell full of water, Captain Phelps found it impossible to raise the cage to the surface, so he started for the lee of Thunder Bay Island with the bell in tow. It was 11:00 PM before the bell was brought to the surface. The manhole was quickly uncovered and the body of Mr. Campbell was found floating, while the body of Olson was fast at the bottom of the cage. Seeing that no help could be given, the manhole was quickly closed and the boat sailed to Alpena towing the bell (*Alpena Weekly Argus* 1898b)(Figure 27).

FIGURE 27. *HA Root* at Alpena docks with Smith's bell alongside. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

The accident abruptly ended the operation, and the American Wrecking and Salvaging Company returned to Milwaukee empty-handed. Despite the cracked porthole, the Smith bell was successfully used in other salvage operations, most notably the gold salvage of *Islander*, off the Alaskan coast (Busch 1975:57). In Smith's eyes, *Pewabic* was chiefly a training ground for his diving bell. The three year expedition proved that the salvage was possible, but more demanding than anyone anticipated. Nevertheless Smith did recover fifty tons of cargo: a mere appetizer in the three-course meal of salvage attempts to come. Nineteenth century expeditions would focus on developing technology to reach the wreck. After Smith's attempt, it was clear that *Pewabic*'s copper salvage methodologies needed more attention.

The "Iron Duke"

Pewabic spent the first decade of the twentieth century undisturbed. America's industrial focus and the growth of the manufacturing industry left *Pewabic* in the background of American concern. The expansion and development of Keweenaw mines made the remaining 200 tons on *Pewabic* less valuable than it had been after the Civil War. Nonetheless, the shipwreck continued to attract inventors.

Benjamin F. Leavitt was the first engineer of the twentieth century to use his invention to salvage *Pewabic*. His dive suit was unlike anything brought to Alpena in the 19th century and had already been tested. In October of 1916, Leavitt set the world record for deepest dive in a descent to 361 feet in Grand Traverse Bay in Lake Michigan (*Scientific American* 1920:46)(Figure 28).

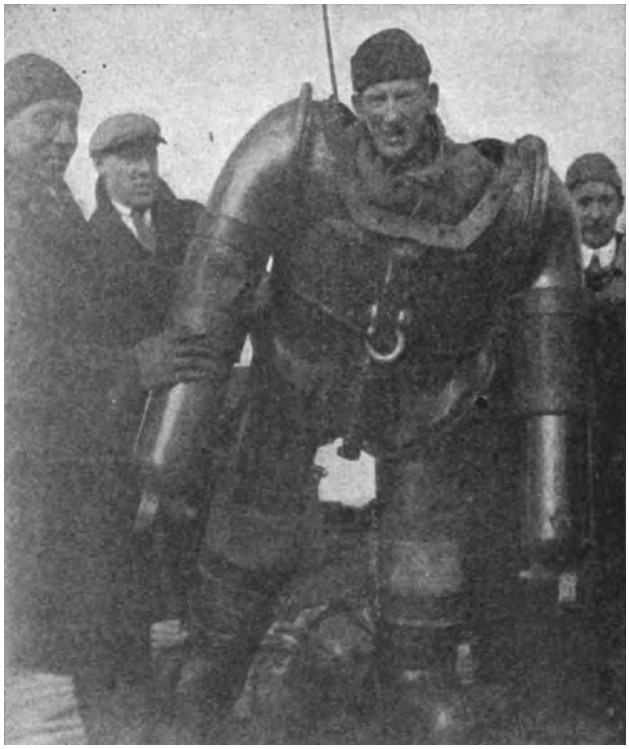


FIGURE 28. Leavitt after his world record descent to 361 feet (*Scientific American* 1920:46).

Leavitt planned to use *Pewabic* as a spring board to salvage *Lusitania*, and other deep water shipwrecks (Dismond 1955). Like the inventors before him, pressure was Leavitt's primary concern. While Pelkey and Brault utilized a rubber suit over metallic inner armor pieces, Leavitt constructed a one-piece, air-sealed bronze suit (Leavitt 1920).

The atmospheric suit design demonstrates Leavitt's applied comprehension of atmospheric pressure. It was built of manganese bronze and had fewer seams and joints, which were failure points in previous designs. Leavitt also designed a spring-loaded moisture detection system that internally isolated the helmet and shoulder piece if water was detected in the lower body. Its arms were rigid and cylindrical, but were almost as strong as the torso and helmet pieces. Leavitt's greatest advance, however, was the introduction of a breathing system carried by the diver. It worked similar to current semi closed-circuit rebreather systems, where exhaled air traveled first through an absorption tank containing caustic soda and then through an oxygen tank that reintroduced the enriched air back into the helmet. The caustic soda absorbed carbon dioxide, and the oxygen supply balanced the discharge gas to 21% oxygen, which the diver then breathed, and the cycle repeated (Leavitt 1920). The system supported life for approximately four hours (Busch 1975:61)(Figure 29).

The abandonment of surface supplied air revolutionized deep sea diving and shipwreck salvage. In several accounts of *Pewabic* salvage, surface air pumps went foul, or supply hoses became tangled in the wreckage (Alpena Weekly Argus 1892a). Leavitt's design gave the diver more autonomy, and relied less on the surface crew for movement and breathing. Leavitt partnered with Margret C. Goodman and created the Leavitt Armor Diving Company (*Alpena News* 1974a). The company sold their plan to wealthy investors, who came to Michigan to witness Leavitt's first descent. Leavitt successfully located the wreck in May of 1917 with the

assistance of Captain John Persons (*Alpena News* 1917a).

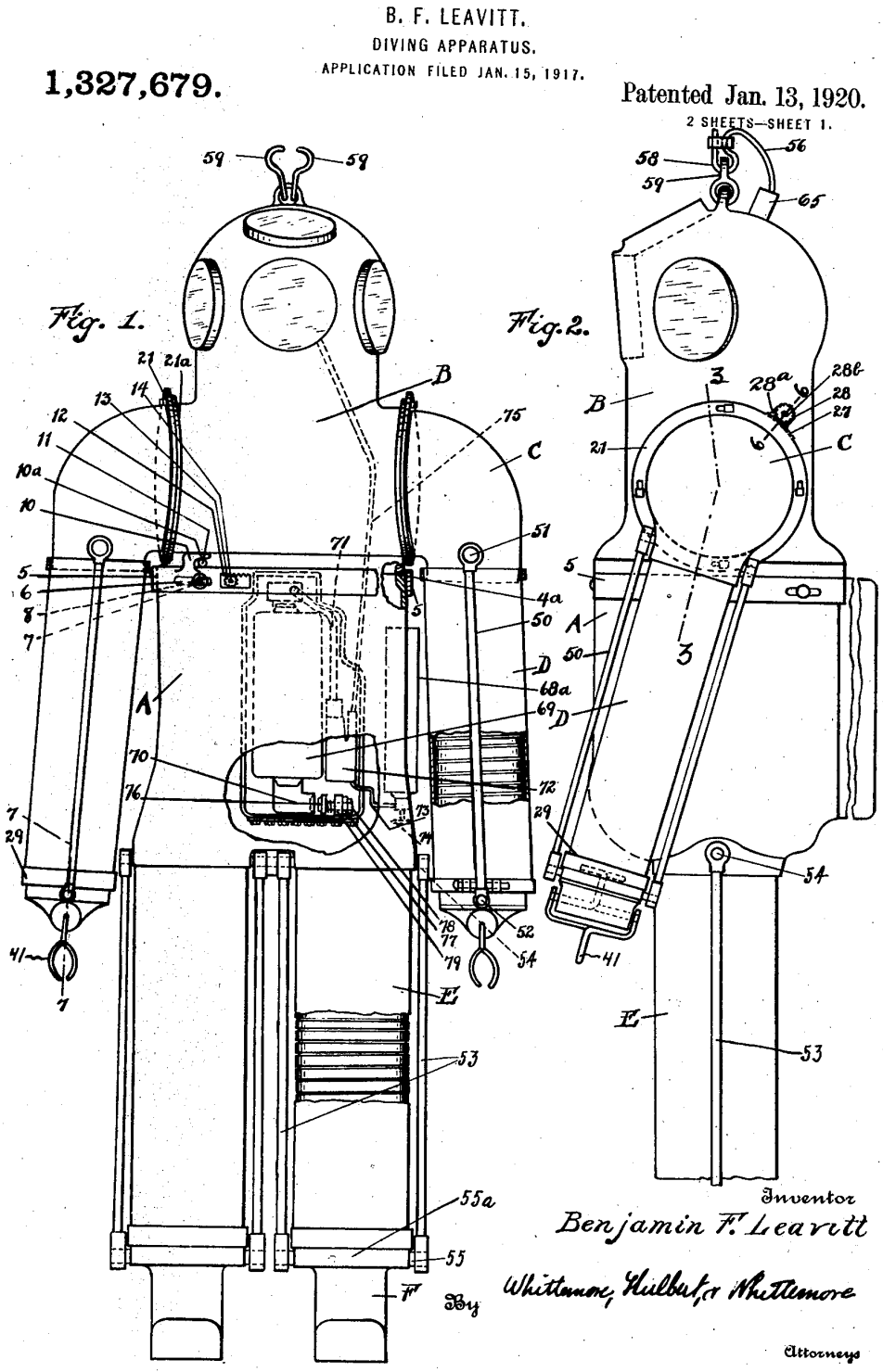


FIGURE 29. Leavitt's patent, an early atmospheric suit with an integrated air delivery system (Leavitt 1920:1).

Leavitt used his suit to direct a clam bucket that dropped from the company-derrick *Eleanor*. This method was successful in the beginning, but Leavitt's dive suit, nicknamed the "Iron Duke", proved to be too cumbersome for the diver to work in (Figure 30, 31). Coupled with the low visibility caused by silt stirred by the clam bucket, the diver's role as bucket director was insignificant (Busch 1975:64).

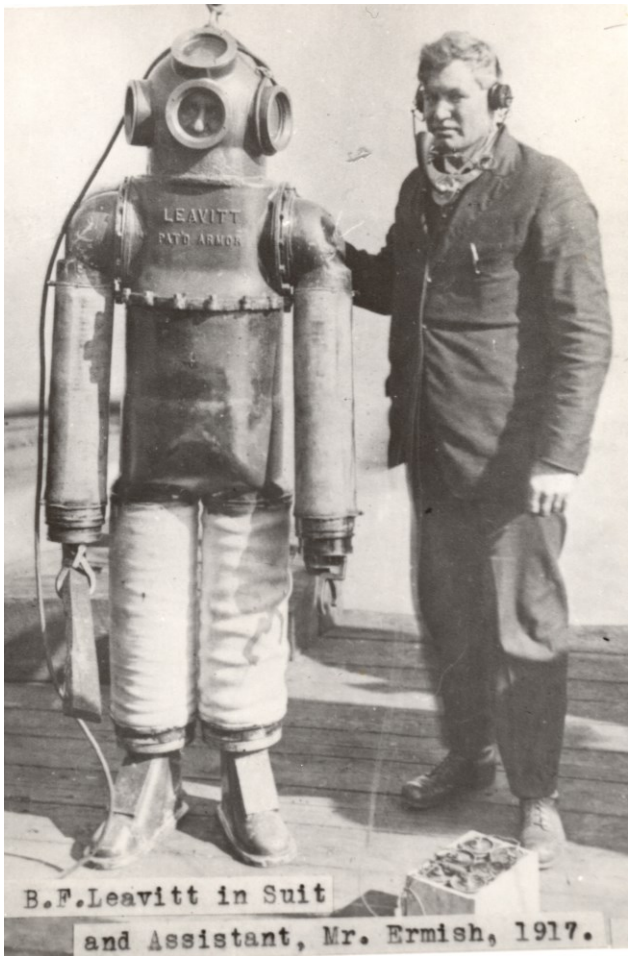


FIGURE 30. This photograph was taken on board *Eleanor* before a dive to *Pewabic*. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

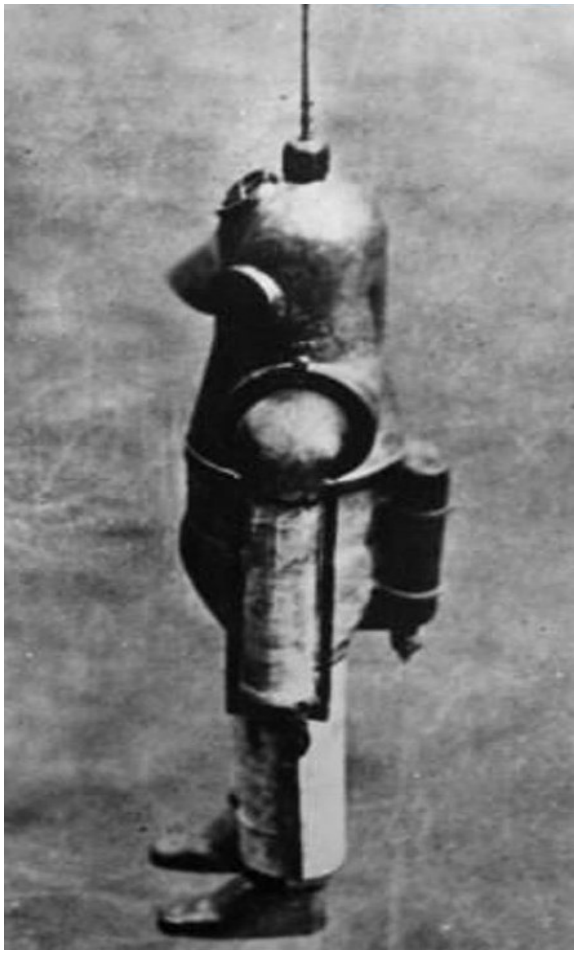


FIGURE 31. This photograph was taken in 1923 during a salvage expedition to *Cape Horn*, in 320 feet of water off the Chilean Coast. (Courtesy of *Time Magazine*).

Blind clam digging accounted for the majority of Leavitt's haul. Over the 1917 season, Leavitt salvaged 70 tons of copper, 50 tons of iron ore, 140 sides of leather and a vast collection of cultural material (*Alpena News* 1917f). The clam bucket operated indiscriminately, and brought thousands of artifacts to the surface. Observers on board *Eleanor* and dockside scavengers pilfered through discarded cultural remains. Most notably was the safe owned by the Lake Superior Express Company. It was rumored to contain jewelry and cash, but when it was opened, the currency was ruined, and the rings possessed little value (*Alpena News* 1917b).

Figure 32 illustrates Leavitt's daily haul and the variety of copper forms that *Pewabic* carried. In the foreground is barrel copper, mass copper, and ingots. To the right of the copper is a safe and umbilical hose for the dive suit. The crew is perched upon a jumbled mass of hull remains that were raised by the clam bucket in the background.

FIGURE 32. Leavitt's crew after a day's work. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

Despite the claim that "the Leavitt people are after copper and when they can get that they waste no time on relics", Leavitt's company curated the first *Pewabic* exhibition in an abandoned Alpena store (*Alpena News* 1917d). Leavitt charged ten cents for admission to view *Pewabic* curios, talk to members of the team, and see the diving suit (*Alpena News* 1917d). The exhibit drew large crowds, and by the end of June it was transported to Toledo.

By the end of summer, Leavitt had achieved similar results to Worden G. Smith. The monetary worth of salvaged material was not nearly as great as anticipated, but the suit performed well enough for the Leavitt Armor Company to remain optimistic about future applications. Leavitt used *Pewabic* as a springboard into other deep-water ventures. In an interview printed in *The Alpena News*, Leavitt remarked:

> We will not return to Alpena to work on the *Pewabic* again. Your weather conditions are entirely too erratic. We have been fairly successful here but not as successful as we might have been. We have, however, demonstrated that our diving armor is a success… The work here has taken so long that we shall not now be able to start our expedition for Alaska waters as we had planned (Alpena News 1917f).

The Dormant Period: 1917 – 1974

August 1917 marked the fifty-second year *Pewabic* spent beneath the surface, and the wreck was slowly taking on historical value. The craze to salvage *Pewabic* largely dissipated after Leavitt's expedition. Roughly one third of its cargo had been removed, and the remaining copper and iron ore lay in precarious positions on the wreck. Coupled with the marginal returns of even well-funded expeditions, *Pewabic*'s ripeness as a salvage target faded and left the wreck undisturbed for the next fifty-seven years. Between 1917 and 1974, *Pewabic* artifacts and curios circulated around the Great Lakes. This material culture diffusion through the Great Lakes

helped infuse *Pewabic*'s story into Midwest shipwreck lore. The resulting public interest in maritime cultural heritage contributed to the passage of the Great Lakes Submerged Lands Act of 1955, which gave the state of Michigan control of all bottomlands and inherent natural and cultural resources within state boundaries.

This act marked the first step taken by the state to manage submerged resources. Part of the management strategy was to employ an umbrella permit system for projects that would "alter the bottomlands" (Graf 2013). Michigan's Department of Natural Resources (DNR) used both the Submerged Lands Act of 1955 and the Antiquities Act of 1929 to minimize shipwreck looting under a diver permit with the slogan "Help Protect Michigan's Historic Heritage" (Department of Natural Resources, State of Michigan 1971). The permit worked similar to the current Hobby Diver License in South Carolina (South Carolina Institute of Archaeology and Anthropology 2010). Divers were permitted to recover loose artifacts that required "no cutting, sawing, breaking, or blasting" (Department of Natural Resources, State of Michigan 1971). In return, the DNR received annual reports from the permitees and reserved rights to any artifacts recovered.

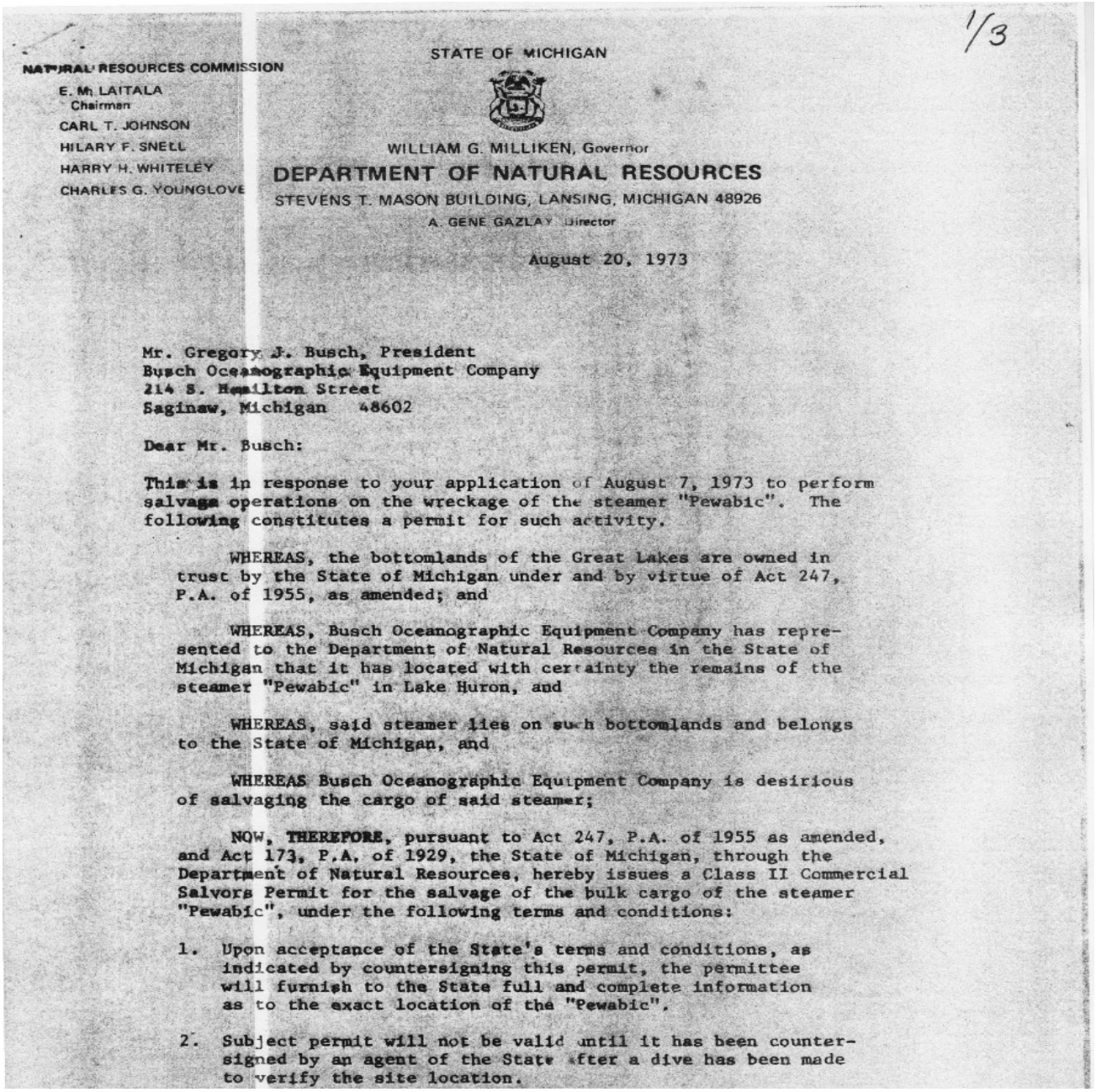
Commercial salvage permits were not granted, but were certainly requested. In July 1971, William Harlan of Sub-Sea Search Incorporated was denied DNR's permission to salvage *Pewabic*. In the response letter, DNR Historic Preservation Coordinator James A. Bryant wrote:

> As time goes on and an underwater historic preservation program develops, it is possible that supervised salvage of certain carefully selected wrecks will be conducted on a contract basis, and you might wish to contact us again concerning this, but under present circumstances the *Pewabic* must remain undisturbed other than by natural forces (Bryant 1971).

Bryant's firm response to Sub-Sea Search appeared to set precedent for commercial salvage requests in Michigan until 1974.

The Final Salvage

On 20 August 1974, Gregory Busch, founder of the Busch Oceanographic Equipment Company, was the first applicant in Michigan history to be granted a commercial salvage permit for a historic shipwreck (Figure 33). His target? *Pewabic*.



1/3

NATURAL RESOURCES COMMISSION
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DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

A. GENE GAZLAY, Director

August 20, 1973

Mr. Gregory J. Busch, President
Busch Oceanographic Equipment Company
214 S. Hamilton Street
Saginaw, Michigan 48602

Dear Mr. Busch:

This is in response to your application of August 7, 1973 to perform salvage operations on the wreckage of the steamer "Pewabic". The following constitutes a permit for such activity.

WHEREAS, the bottomlands of the Great Lakes are owned in trust by the State of Michigan under and by virtue of Act 247, P.A. of 1955, as amended; and

WHEREAS, Busch Oceanographic Equipment Company has represented to the Department of Natural Resources in the State of Michigan that it has located with certainty the remains of the steamer "Pewabic" in Lake Huron, and

WHEREAS, said steamer lies on such bottomlands and belongs to the State of Michigan, and

WHEREAS Busch Oceanographic Equipment Company is desirious of salvaging the cargo of said steamer;

NOW, THEREFORE, pursuant to Act 247, P.A. of 1955 as amended, and Act 173, P.A. of 1929, the State of Michigan, through the Department of Natural Resources, hereby issues a Class II Commercial Salvors Permit for the salvage of the bulk cargo of the steamer "Pewabic", under the following terms and conditions:

1. Upon acceptance of the State's terms and conditions, as indicated by countersigning this permit, the permittee will furnish to the State full and complete information as to the exact location of the "Pewabic".

2. Subject permit will not be valid until it has been countersigned by an agent of the State after a dive has been made to verify the site location.

FIGURE 33. Busch's salvage contract in three pages. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

3. Permittee is granted exclusive rights to salvage the bulk cargo, except for two copper ingots, which shall be released to the State.

4. The State claims exclusive rights to all artifacts including those found within the general merchandise portion of the cargo. If the State finds any artifacts within the general merchandise cargo surplus to its needs, the permittee shall be entitled to any such artifact not desired for retention by the State, without costs.

5. The permittee shall remove and deliver to the State artifacts which may be designated by the State. Requests by the State shall be reasonable within the capabilities of the permittee.

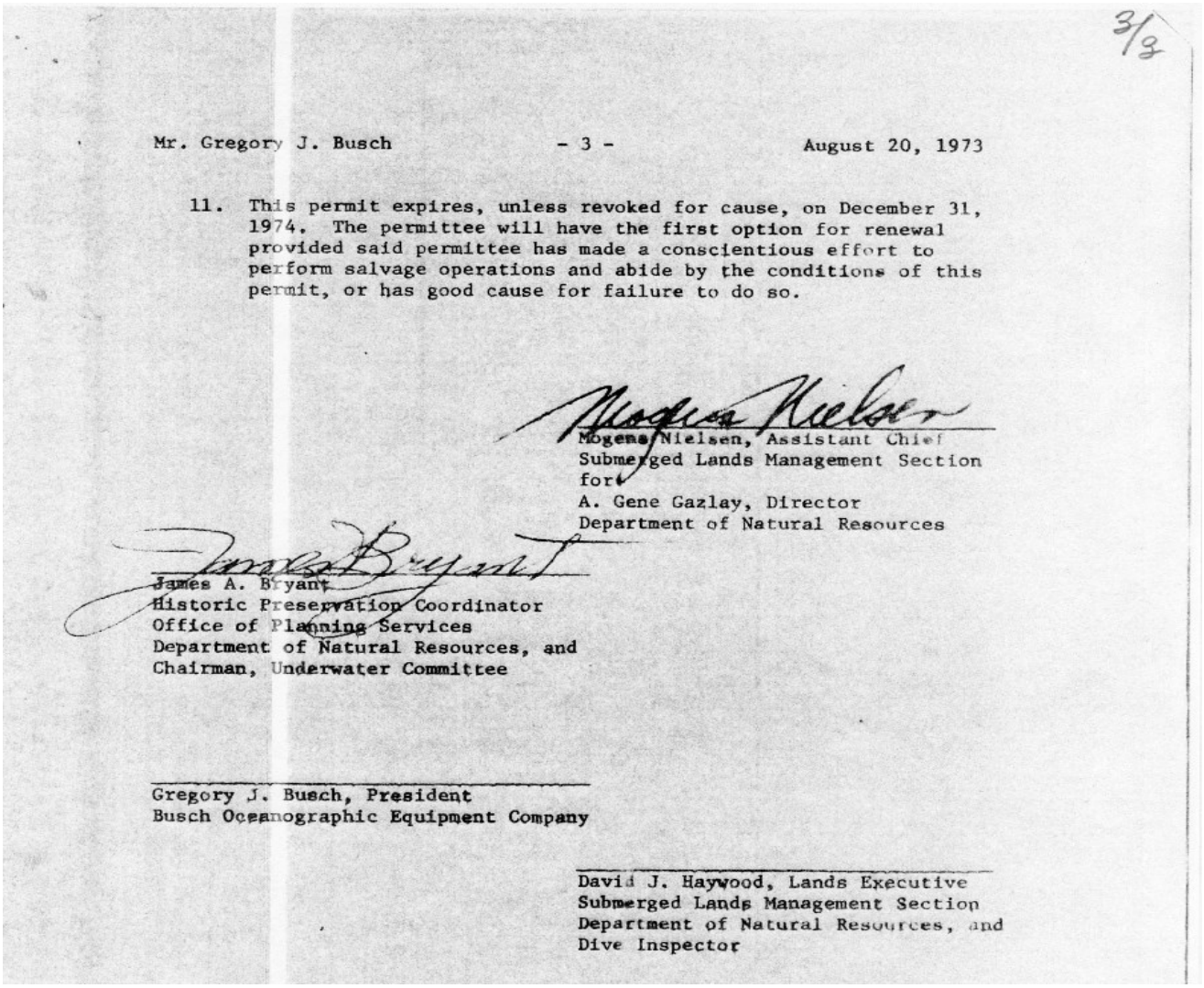
6. The site and wreck shall be left in the same general condition as exists at the beginning of the operation, with the exception of the items claimed by the State, and the cargo. If it is determined that removal of cargo will affect a structural alteration of the wreckage of the "Pewabic", then drawings and photographs shall be made by the permittee and submitted to the State before any disturbance of the site or wreckage.

7. Uncut motion picture color film footage of all operations, and 35 mm color slides as necessary for complete documentation, shall be submitted, at no cost, to the State by the permittee.

8. All salvage, photographic and documentation operations, as prescribed by this permit, shall be under the control of the permittee.

9. Reasonable inspection by employees of the State, as determined by the Department of Natural Resources, shall be part of the salvage operations and such personnel shall provide their own personal diving equipment. Permittee shall provide, during the course of normal operations, such supporting facilities as necessary, as determined by the State Inspector, to insure the safe completion of the inspection dives.

10. The permittee will keep a record of all items recovered from the "Pewabic" and the State will have the option of inspecting all said items.



Mr. Gregory J. Busch - 3 - August 20, 1973

11. This permit expires, unless revoked for cause, on December 31, 1974. The permittee will have the first option for renewal provided said permittee has made a conscientious effort to perform salvage operations and abide by the conditions of this permit, or has good cause for failure to do so.

Mogens Nielsen, Assistant Chief
Submerged Lands Management Section
for
A. Gene Gazlay, Director
Department of Natural Resources

James A. Bryant
Historic Preservation Coordinator
Office of Planning Services
Department of Natural Resources, and
Chairman, Underwater Committee

Gregory J. Busch, President
Busch Oceanographic Equipment Company

David J. Haywood, Lands Executive
Submerged Lands Management Section
Department of Natural Resources, and
Dive Inspector

Alongside his father on board *Ruth B*, Busch used rudimentary remote sensing equipment to locate the wreck, including an underwater closed circuit television system, a recording fathometer, a proton gradient magnetometer, and side scan sonar. Both the magnetometer and television system were developed and built by their company (Busch 1975:75). Their utilization of homemade equipment mirrors the inventions of Pelkey, Brault, Smith, and Leavitt. The

wreck's location was confirmed on 21 July 1973 but Busch did not make a descent until the following summer (Busch 1975:78).

Busch greatly benefitted from 20th century advances in commercial diving and dive medicine. The 1974 expedition utilized equipment that is now standard in deep water commercial projects: dry suits, updated surface supplied air delivery systems, an on-site recompression chamber, multiple gas diving, compressed-air tools, and industrial underwater lights (Busch 1975:92). Fair weather and effective dive rotations allowed Busch to operate from dawn until dusk, and lifted two to three tons of copper per day (Busch 1975:97). Once on the wreck, the diver excavated a target area and placed discovered copper into a large drum that was winched to the surface (Robert Massey 2013, pers. comm.).

Despite several episodes of decompression sickness and ear injuries, it is not surprising that Busch's expedition in 1974 was fruitful. Busch never disclosed the specific tonnage recovered, but is it between one hundred and one hundred and fifty tons, based on the deductions of confirmed amounts taken in 1897 and 1917. When compared to the hull destruction of the 1897 and 1917 expeditions, the impact of the 1974 salvage on the wreck was minor, but the removal of cultural material was significant. As result of Busch's agreement with the DNR, some artifacts were given to the state, including one anchor, but most cultural material was sold to private collectors "because of their rarity and historical value" (*Alpena News* 1974b). The expedition of 1974 was the final commercial operation conducted on *Pewabic*.

The story of *Pewabic* is as much about the ensuing events after the collision in 1865 as it is about its history afloat. Between 1865 and 1974, *Pewabic* not only witnessed, but directed revolutions in deep-sea exploration technology and marine salvage. As a salvage training ground, "Lake Huron's Death Ship" claimed ten lives during this period, yet still beckoned the bold to its

depths. It was desired for its monetary value and as an Everest for competitive shipwreck salvagers. Since Busch left Alpena in October of 1974, *Pewabic* has entered the second phase of its post-wrecking life as a research asset, education tool, and as an iconic representative of a 19th century Great Lakes vessel type. This transformation in value began with state legislation in the 1970s that set the groundwork for effective state and federal collaborative management strategies.

Early State Legislation

The sport diver permit system of 1971 did little to reduce looting. Sport divers actively opposed the system, and the DNR lacked the financial resources and personnel to enforce penalties (Halsey and Lindquist 2003:109). Thankfully, after a decade of wholesale shipwreck looting, Michigan sport divers realized the importance of resource preservation, for both future recreation and as a sustainability measure for Michigan's diving industry. The diving community was largely responsible for Michigan Public Act 184, which established a formal process for the salvaging of submerged cultural resources. This objective was largely in response to the wavering salvage protocols of the early 1970s, exemplified by James Bryant's *Pewabic* permit decisions in 1971 and 1974.

P.A. 184 also mandated that the DNR designate Bottomland Preserves (Halsey and Lindquist 2003:109). The Thunder Bay Underwater Preserve was designated in 1981 as the first Preserve (Yoder 1992:7). The goal was to encourage responsible visitation of submerged historic sites. The Preserves illuminate Michigan's shipwrecks as shared cultural history through pamphlets, shore signage, and information available at visitors centers and dive shops. These outreach materials give historical background, coordinates, and site features of selected wrecks

within Preserve boundaries. P.A. 184 was amended in 1988 as part of Public Act 452 which clarified ambiguous language and raised fines for divers convicted of illegal salvaging. Convicted divers will have their boat, scuba gear, sonar equipment, automobile, and any other equipment used during the salvage confiscated (Halsey and Lusardi 2008:30).

Federal Involvement

The Underwater Preserve system and salvage restriction clauses in P.A. 452 made Michigan the Great Lakes leader in submerged cultural resource management before the Abandoned Shipwreck Act of 1987 (ASA) (Yoder 1992:16). The ASA worked in tandem with P.A. 452 to confirm and strengthen Michigan's protective grasp on its submerged cultural resources.

While P.A. 184 granted Michigan ownership of *Pewabic*, it was the establishment of the Thunder Bay National Marine Sanctuary and Underwater Preserve in Alpena that finished *Pewabic*'s transformation from salvage target to an active maritime cultural heritage site. The National Marine Sanctuary Program of the National Oceanic and Atmosphere Administration (NOAA) recognized state and local efforts to protect the resources of the Thunder Bay Underwater Preserve, and offered to bring the Preserve into the national spotlight. NOAA has partnered with state managers from Michigan's Department of History, Arts, and Libraries, the Department of Environmental Quality, and the DNR to take the protected resources of Thunder Bay and project their value and historical significance to not only local residents and visitors, but to the nation. *Pewabic* is a great case study that emulates their mission to "preserve nationally significant shipwrecks and regional maritime landscape through resource protection, education, and research" (Thunder Bay National Marine Sanctuary 2009).

Despite its depth, *Pewabic* has been a poster child of the Thunder Bay National Marine Sanctuary and Underwater Preserve (TBNMSUP) since the institution's designation in 2000. *Pewabic*'s transformation from salvage target to iconic piece of cultural history has seen the greatest gain through sanctuary initiatives within the last decade. The wreck has been utilized in three major sanctuary avenues: research, education, and outreach.

Pewabic was first investigated by researchers in 2003, when Dr. Bob Ballard employed ROVs to capture the wreck on high-definition video (Thunder Bay National Marine Sanctuary 2005). The visit was part of a larger mission to record sanctuary resources in deeper water. The footage inspired a thorough investigation in 2005 that produced a photo mosaic and site plan. NOAA staff conducted monitoring dives on *Pewabic* as part of a closed circuit rebreather training in August of 2012. Deputy Sanctuary Superintendent Russ Green acknowledges that the wreck has changed since 2005; artifacts placed on deck by divers have moved, and zebra/quagga mussels have claimed the wreck's entire surface (Russ Green 2013, pers. comm.). During the 2013 field season, sanctuary staff conducted side scan sonar operations that created another benchmark image (along with the 2005 mosaic) enabling resource managers to compare the wreck's degradation in the future. Monitoring the site for traceable evidence of both cultural and natural transforms is a primary long-term goal for TBNMS's research division (Office of National Marine Sanctuaries 2013:45).

On the education front, *Pewabic* is featured throughout the sanctuary's visitor's center, the Great Lakes Maritime Heritage Center (GLMHC). *Pewabic*'s state artifact collection is featured downstairs in the artifact display case, where visitors can learn about the different forms of copper on board *Pewabic*, and hear the stories of the victims through leather shoes, silver spoons, dinnerware, and a champagne bottle. Also on the first floor is a 4' X 14' enlargement of

the photo mosaic mounted on the wall. Sanctuary educators utilize the mosaic to show visitors how mosaics can supplement archaeological recording, and to emphasize *Pewabic*'s unique structural features.

Pewabic is also the passenger/package freight propeller example in the "Shipwreck Century" exhibit which traces the evolution of Great Lakes vernacular craft from dug out canoe to bulk freighter. A scale model, wall text, and the conserved safe from the 1974 salvage operation help visitor's connect *Pewabic*'s role in regional history to its construction features, and the detrimental effects of salvage on historical shipwrecks. These themes are also found on the Great Lakes Maritime Heritage Trail, which is situated along the historic Thunder Bay River.

Pewabic has also been use by sanctuary educators in K-12 classrooms. The 7th grade physical science lesson "Thunder Bay 2010: Cutting-Edge Technology and the Hunt for Lake Huron's Lost Ships - Death Ship" uses *Pewabic* to teach students about steam engines: function, application, and major components. In the second part of the lesson, students get to build a model steam engine out of paint cans, wooden skewers, rubber tubing, and wine corks (National Oceanic and Atmospheric Administration 2010:1). Students learn hands-on about steam engines, energy conversions, and AUV surveys with the *Pewabic* collision story as an introduction.

In another installment of this lesson series, high school students learn how shipwrecks can provide information to maritime archaeologists about the associated wrecking event (National Oceanic and Atmospheric Administration 2010b:1) . The students take an investigative role using historic nautical charts, a list of retrieved artifacts, and a fictitious vessel logbook to draw inferences about the *Pewabic* collision with *Meteor*. These two lessons demonstrate *Pewabic*'s applied value as a liaison to maritime heritage education in K-12 classrooms.

While the K-12 and GLMHC *Pewabic* education initiatives are directed towards the local audience, *Pewabic*'s history has been diffused across the nation by outreach and the Internet. *Pewabic* has been part of sanctuary presentations, information booths, and circulating pamphlets delivered at academic conferences, dive shows, and regional heritage events (Russ Green 2013, pers. comm.). The sanctuary website is yet another avenue for *Pewabic* projection. On its vessel information page, the sanctuary has posted *Pewabic*'s basic measurements, site description, historical information, and GPS coordinates (Thunder Bay National Marine Sanctuary 2013). The release of historical and location information has transformed local divers into stewards of submerged cultural heritage. This strategy of preservation-by-education has also proved effective in Lake George (Zarzynski et al. 2014:205). These education and outreach initiatives have greatly enhanced responsible visitation of *Pewabic*, and curbed its century-long notoriety as a salvage target. The sanctuary is the latest in the long string of events that have affected *Pewabic*, and has certainly been the most effective in harnessing the wreck's research and educational potential.

Many diverse interest groups have affected *Pewabic*'s role and value over the past 153 years and the study of its post-wrecking history is paramount to understanding its history afloat. From salvage target to shipwreck celebrity, the wreck of *Pewabic* has witnessed revolutions in underwater exploration technologies and state/federal resource management partnerships. It will continue to be a pivotal research and education tool for the sanctuary, and a poster child for the application potential of deep water shipwrecks.

CHAPTER FIVE: MATERIAL CULTURE

Introduction

The 1865 advertisement for the Pioneer Lake Superior Line is an excellent starting point from which to interpret *Pewabic*'s material culture (Figure 34). First class cabin tickets were most profitable for the line and the voyage descriptions targeted leisure travelers who would encounter this window advertisement in downtown Cleveland or Detroit.

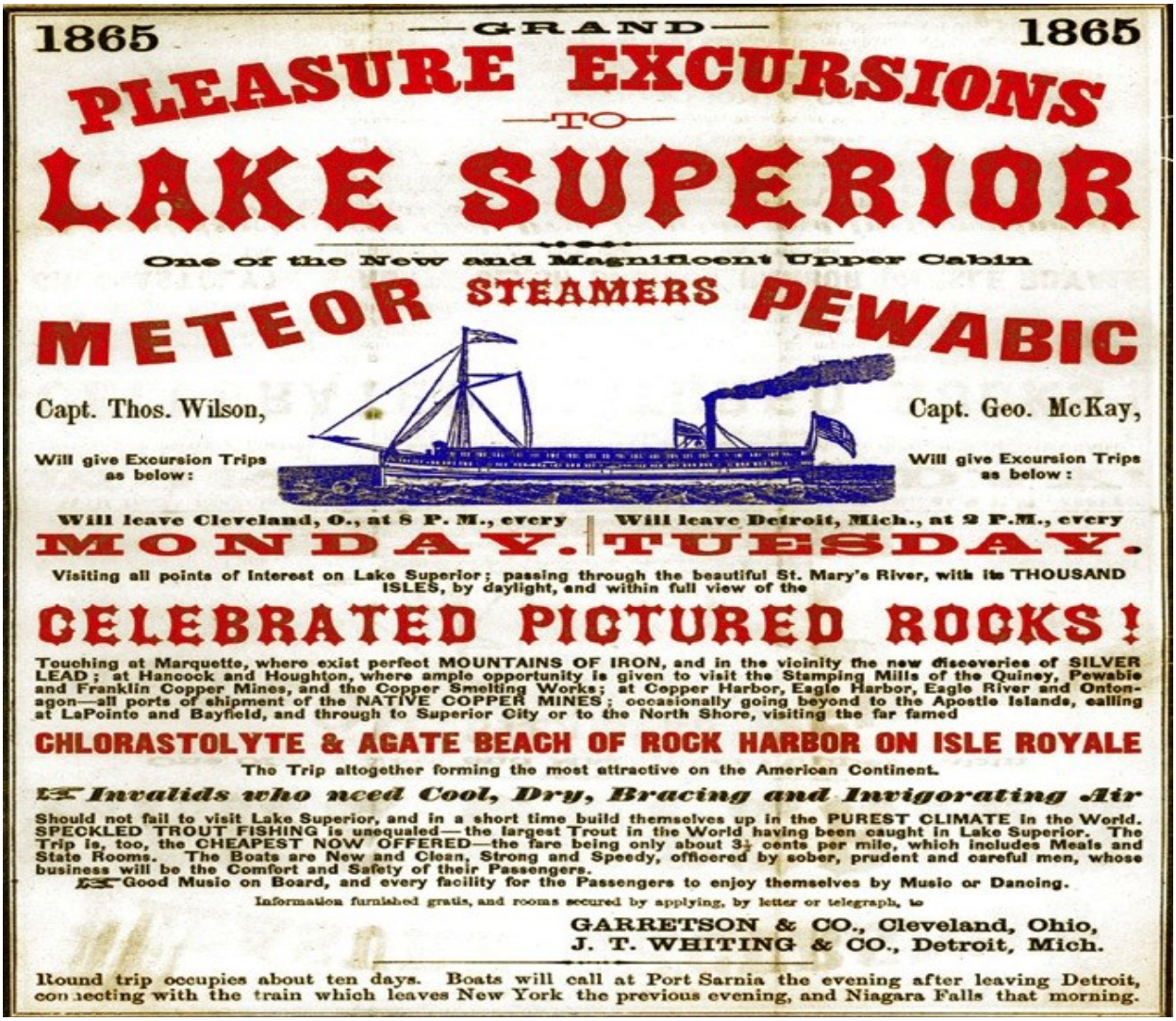


FIGURE 34. *Pewabic* advertisement. (Courtesy of the Thunder Bay Sanctuary Research Collection, Alpena, MI.)

While there is no mention of steerage passage fares on the advertisement, *Pewabic* did service lower classes, but the proportion of cabin to steerage passengers is unknown. Charles A. Mack, clerk of *Pewabic*, claimed there were between 100 and 125 cabin and steerage passengers on board *Pewabic* on its final voyage (Dismond 1955).

The ratio of steerage and first class passengers on board *Pewabic* is difficult to decipher from the material cultural record because all artifacts have been raised by salvagers, so important provenience data on passenger effects has been lost. What does remain, however, is an extensive cumulative collection that reflects *Pewabic*'s economic and social interests through many isolated artifacts. *Pewabic*'s material cultural interpretation is unique is this regard. It is not archaeologically focused, but instead concerned with the role that *Pewabic*'s artifacts have played in cementing the shipwreck in regional social memory.

Recovery efforts since its sinking have distributed *Pewabic*'s material culture for management by four interests: commercial salvaging, the sport diver community, federal/state resource managers and museums. No archaeological excavations have been executed to date. *Pewabic*'s salvage is reported on in chapter four but the degree of *Pewabic*'s pillaging by sport divers will never be known, so the only material culture study of *Pewabic* resides in the documented activities of early salvaging companies prior to 1987 and the role of federal, state, and private organizations in curating what has survived. The surviving but scattered assemblage demonstrates the potential interpretive gleanings from salvaged artifacts with no known provenience to the wreck.

Pewabic's state of preservation has been influenced both positively and negatively by natural and cultural processes. Until recent introductions of invasive species such as zebra mussels, the cold freshwater of Lake Huron left *Pewabic* unbothered by biological organisms

due to the fact that it benefits from clear, current-free icy water. Little light can penetrate to the 170 foot depth and the possibility for biological existence is further decreased. As a result, organic material recovered from *Pewabic* is generally in an excellent state of preservation; it was reported that once a recovered evening dress was dried, you could smell the perfume that the wearer had used (Dismond 1955).

Pewabic's depth is also an obvious deterrent to the average sport diver. While *Pewabic* artifacts have always maintained a collector market, only technical divers and commercial salvagers have walked its decks. However, the prime natural conditions of *Pewabic*'s wreck site have been compromised by cultural transforms: dynamite and clam buckets. The copper cargo carried obvious monetary value throughout *Pewabic*'s term on the lake bottom. Beginning in the early 20th century, pieces of ship and personal effects were sold between private collectors and to the public (Figure 35).

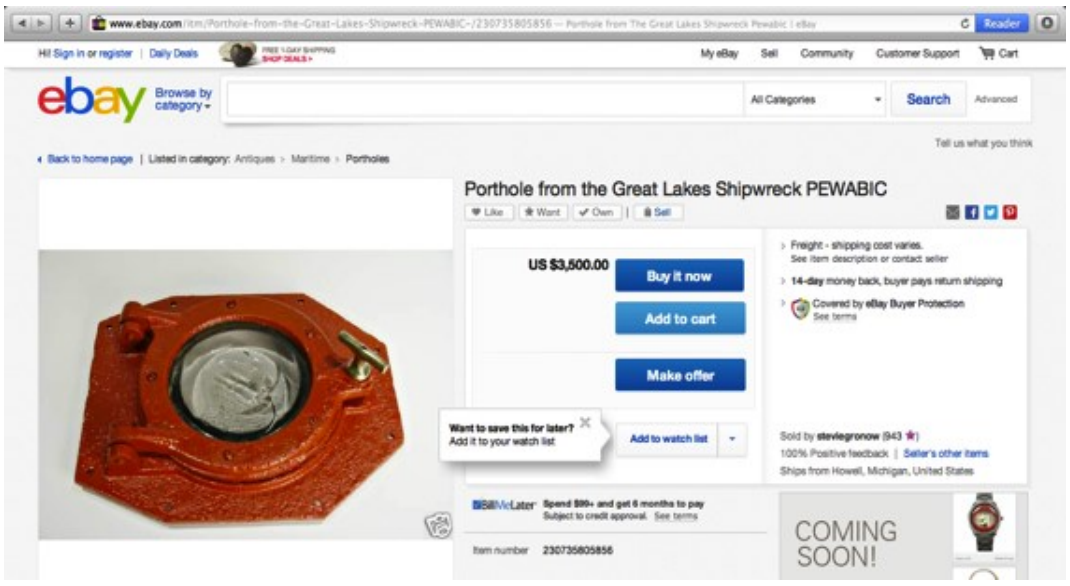


FIGURE 35. Expired Ebay advertisement for a *Pewabic* porthole priced at $3,500. (Courtesy of Ebay.com)

Beginning in the fall of 1865, salvagers have risked life and limb to retrieve *Pewabic*'s copper cargo, valued at $195,000 in 1865 (*Eerie Daily Dispatch* 1865b). More alluring to early salvagers were extravagant reports of "an immense amount of money belonging to the Express Companies, commercial men and passengers" held in a safe (*Eerie Daily Dispatch* 1865c).

What Was Salvaged, When?

The American Wrecking and Salvage Company conducted the first well-funded attempt in 1897. While fatalities halted the operation in 1898, the American Wrecking and Salvage Company did retrieve fifty tons of copper from the wreck in the form of barrel and float copper (*Alpena News* 1974). The copper only yielded $11,000 and did not cover the cost of the operation. To date, none of the artifacts collected in 1897 have been located.

Twenty years later, B.F. Leavitt salvaged *Pewabic* to demonstrate his dive suit and fund the operation through the sale of recovered copper. *Pewabic*'s lure and potential profit skyrocketed since 1895: the copper in 1917 was said to be worth millions (*Alpena News* 1917a). Leavitt brought up the first documented passenger artifacts. While no pictures exist of these first artifacts, local news reports "a piece of rail, part of the bulwark, and some scrollwork evidently from the interior of the cabin, it consisted of a carving of a man's head and an American eagle" (*Alpena News* 1917b). Leavitt retrieved part of the stove three days later "indicating that they are reaching the heart of the ship" (*Alpena News* 1917e).

Leavitt's success attracted the attention of local residents who went on board his wrecker *W.J. Meagher* to view the operation and to secure any curios or pieces of the hull (Figure 36). Most of these items were passenger effects or pieces of ship that carried little monetary value. A

woman's shawl, a horse halter, pulleys, engine room parts, human remains, clothing, a revolver, jewelry, trunks and the steel foot of Smith's diving bell were among the artifacts that local residents sorted through on board Leavitt's salvage wrecker e, 1917f). Leavitt and the clam bucket proceeded to recover seventy-two tons of copper worth $40,000 during the 1917 season (*Alpena News* 1918).

FIGURE 36. Mrs. Margaret Goodman watches the salvage expedition from the *Meagher* (Busch 1975:63).

The 1917 Leavitt expedition left lasting scars and contributed to *Pewabic*'s dilapidated state of preservation. The clamshell destroyed almost everything in its path. Gregory Busch conducted the most profitable (and destructive) salvage expedition in 1974, the first and last in the modern age. In addition to copper ingots, Busch recovered the infamous safe on 3 July 1973 (Busch 1975:99)(Figure 37). The barrel hoist that Busch would fill with ingots is also pictured in the right of Figure 37.

FIGURE 37. Gregory Busch (right) unties the recovered safe (Busch 1975:102).

It ultimately contained two disintegrated leather pouches; Busch could only restore a five-dollar bill from 1865 and a check from the Ridge Mining Company (Busch 1975:102). As part of his DNR contract, Busch recovered 86 artifacts that were later donated to the Michigan Historical Museum in October 1974 (Busch 1974). Many of these artifacts are dinner whiteware and porcelain fragments from pitchers, saucers, and plates with the engraving “MCRR”, which stands for Michigan Central Railroad (Figure 38).

FIGURE 38. MCRR logo found on the back of saucer sherd, 20UH002.01.18. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

The "Mackinaw" pattern is identified by the cinched garter belt that encircles the Michigan Central's logo (Krummes 1994:7). Prior to the Panic of 1857, railroad companies bought steamers to connect rail lines around the lakes and to reduce passenger competition from boat operators. The Panic of 1857 and the expensive losses of MCRR steamers *Flower*, *Atlantic*, and *Ocean* discouraged continued lake service by the MCRR and all steamboat assets were sold. *Pewabic*'s tableware was acquired second-hand from the Michigan Central Railroad (Marsh 2007:82).

Many of these artifacts with the MCCR logo are now part of the state collection, housed at the Thunder Bay National Marine Sanctuary (TBNMS), and managed by the State Historic Preservation Office. Other artifacts, donated by local residents, complete the *Pewabic* assemblage at TBNMS. The assemblage reflects *Pewabic*'s frequently disturbed post-mortem state (Figure 39).

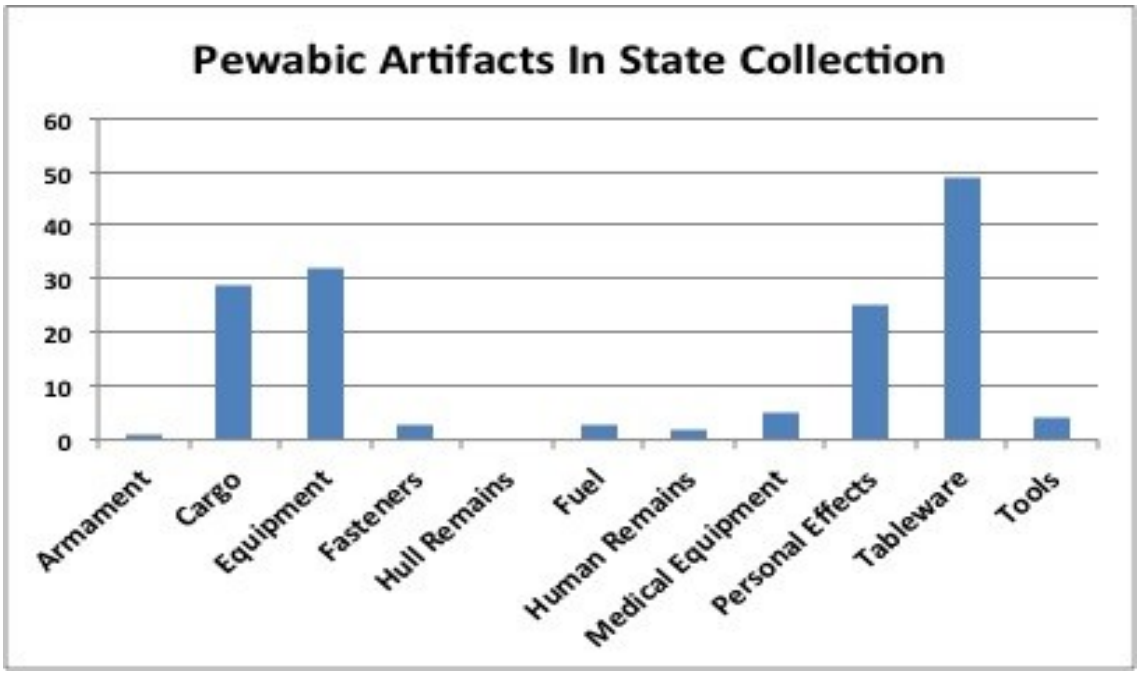


FIGURE 39. *Pewabic* artifacts owned by the State of Michigan's Office for Maritime Archaeology. (Figure by Author, 2013.)

State Collection: Armament

One 5 pound iron round shot comprises the armament category (Figure 40).

FIGURE 40. The sole *Pewabic* artifact in the armament category. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

The round shot belonged to the Mackinaw Union soldiers, who were relieved of their northern post a few months earlier (*Alpena News* 1934). Mackinaw Island was an important post that guarded the straits of Mackinaw, the crossroads of Lakes Huron and Michigan (Michigan Historical Commission 2012:4). Many secondary news sources report that Union soldiers were on board (Sowa 1963). Some suggest that the Union soldiers were escorting Confederate prisoners from their Mackinaw cells to the Southern United States (*Alpena News* 1983).

State Collection: Cargo

The cargo is comprised of representative pieces of float, ingot, or barrel copper and a few pieces of iron ore, none of which have required conservation. The ingots were shipped in wooden barrels that contained one hundred ingots and weighed approximately 1600 pounds. Busch could load up to fifty loose ingots into a tethered fifty-five gallon drum on a twenty-minute dive (Busch 1975:96).

The ingots were smelted with three peaks, two on the ends and one in the middle. Two saddle-shaped low points separate the peaks that allow the ingots to be handled and stacked efficiently. Each ingot is stamped with the mine's name from in an abbreviated code, but the stamping system is not uniform. Ingots from Quincy Mining Company, for example, are stamped "Q-M-Co" while ingots from Pewabic Mining Company are stamped "PW-LST-MC". The abbreviated stamp is read "Pewabic Mining Company, Lake Superior Transit Company" (Figure 40). JT Whiting's Pioneer Line, which included *Meteor* and *Pewabic*, was a division of the larger Lake Superior Transit Company (LST). Franklin and Hancock Mining Companies stamped their ingots in a similar manner: "F-LST-MC" and "H-LST-MC". Based on these ingots, it appears that LST had exclusive shipping rights with the Pewabic and Franklin Mining Companies.

Assorted float and barrel copper are also possessed by the state. These artifacts range in

size, but are all in similar states of preservation (Figure 41). Float and barrel copper are exceptionally pure copper samples that did not undergo smelting at Portage Lake facilities. Depending on metal purity, smelting copper at facilities in Detroit or Cleveland was more economical than doing so in the Upper Peninsula. Smelting was exceptionally expensive, especially in the northern region where supplies and operation resources were imported.

FIGURE 41. Comparison of Quincy, Franklin, and Pewabic Mining Company ingots. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

FIGURE 42. 20UH002.06.05.02: a typical piece of float copper. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

State Collection: Equipment

Mechanical ship parts, valves, lamp parts, and stove legs are some examples of the "equipment" artifacts that are currently on display at TBNMS. Most of these artifacts have completed conservation. A rib and long bone were donated as part of the third accession of artifacts of 2001. These two pieces poorly reflect the thirty-three fatalities during the wrecking event, and at least eight more pieces of bone were taken during salvage attempts. There is no doubt more remains of steerage passengers still trapped in the hull, as illustrated by Gregory

Busch:

> While digging through the silt one afternoon my hand touched something solid. I picked it up and held it against the front window of my diving helmet. It was dark so I switched on my diving light. The light filtered through the empty eye sockets of a human skull minus its lower jaw! All they heard over the communicator was "Oh my God… pull me up!" (Busch 1975:95).

Though lacking archaeological method, Busch's salvage report does give *Pewabic*'s artifact assemblage some broad context. For example, one of *Pewabic*'s largest conserved artifacts is mentioned in the details of Busch's initial dive, "I explored the aft hold and found that it was empty except for a six foot circular saw blade and four rolls of leather" (Busch 1975:85). It is not certain that the mentioned blade is 20UH002.UN.033, but the odds are encouraging. The blade could have been traveling downbound for repair or sale. Volunteers at TBNMS had to remove the rusted center bolt that sandwiched the blade to two wooden planks. Once the iron blade was solitary it was treated with tannic acid. The wooden planks were replaced and the blade is now on display at the Great Lakes Maritime Heritage Center (GLMHC) at TBNMS.

State Collection: Tableware

White ironstone tableware (pitchers, saucers, plates, sherds) is also on display at the GLMHC. *Pewabic*'s tableware is of particular interest because there is no evidence of *Pewabic* ever having a complete set of *Pewabic* china. Despite *Pewabic*'s reputation as "one of the finest propellers on the lakes", passengers dined off a heterogeneous table set (*Alpena Weekly Argus* 1879). Most of the ironstone tableware that features the North Shore Line monogram has a British makers mark on the back (Figure 42). Davenport was one of the three large Staffordshire

firms that maintained industry hegemony until the 1850s, largely due to demand in American markets (Blaszcyk 2002:55).

FIGURE 43. Saucer, 20UH002.01.16 has the Davenport Ironstone markers mark. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

The North Shore Line owned six propellers (*Pewabic*, *Meteor*, *Detroit*, *Mineral Rock*, *General Taylor*, *Skylark*) and one paddlewheeler (*Illinois*) in 1864 and the tableware was probably mass ordered for use in any, or all of the seven boats (Croneweth 1897a).

Even though JT Whiting and his Pioneer Line accounted for two thirds of the Superior trade from 1855 through the middle 1860s, his boats needed frequent repair. Whiting sold the propellers *Detroit*, *General Taylor*, and *Skylark*, while *Mineral Rock* was dry-docked for a rebuild during the summer of 1864 (Croneweth 1897a). These repairs left only *Pewabic* and *Meteor* in service for the 1865 season and they were outfitted with tableware from earlier North Shore Line vessels to cut costs. The Civil War consumed American manufacturing industries and imported goods were increasingly unaffordable as foreign manufacturers had large contracts with

both the Confederate States and the Union military.

20UH002.01.17 enforces *Pewabic*'s heterogeneous tableware set. Michigan's Office for Maritime Archaeology suggests this small dish may have been used for bone discard in the main dining room. On the back is a peculiar makers mark that denotes this dish was made in the United States (Figure 43).

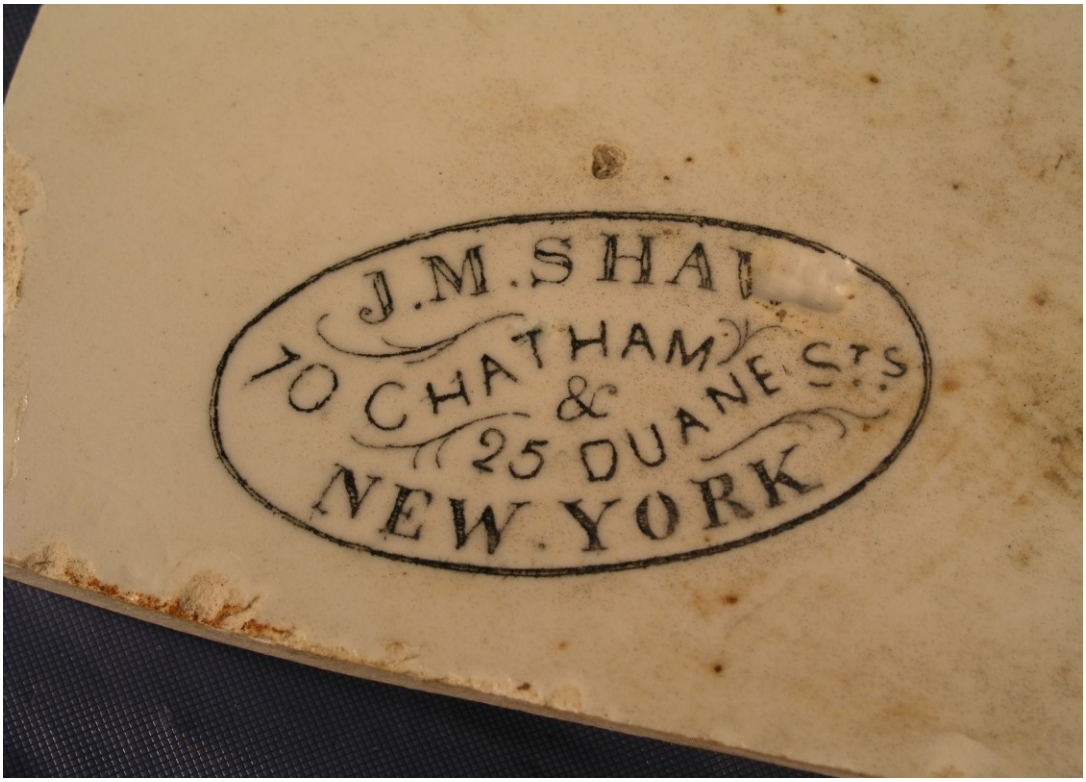


FIGURE 44. This makers mark only appears on one artifact in the *Pewabic* assemblage. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

The recovered champagne bottle is one artifact that confirms the festive atmosphere on board *Pewabic* on its last voyage (Figure 44). Survivor accounts verify dinner had just finished on board *Pewabic*, and the cabin boys were preparing the saloon for dancing (Russell 1892). It is likely that the champagne was poured in the hour before the collision.

FIGURE 45. Champagne bottle, 20UH002.SM-169-75. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

Besser Museum

The Besser Museum for Northeast Michigan is a mile down the road from the GLMHC and has its own collection of *Pewabic* material culture (Figure 45). 58% of Besser's collection was donated in 1979 by Mr. and Mrs. War Brundage, who inherited the pieces from local historian Fred Trelfa.Trelfa was an Alpena community leader, Mason, and proponent of local history. He personally acquired the artifacts from the 1917 and 1974 salvage expeditions (Clark

Historical Library 2013). Most of Besser's collection originates from the 1917 and 1974 salvage expeditions. Their collection is smaller than the state's, but includes several significant artifacts.

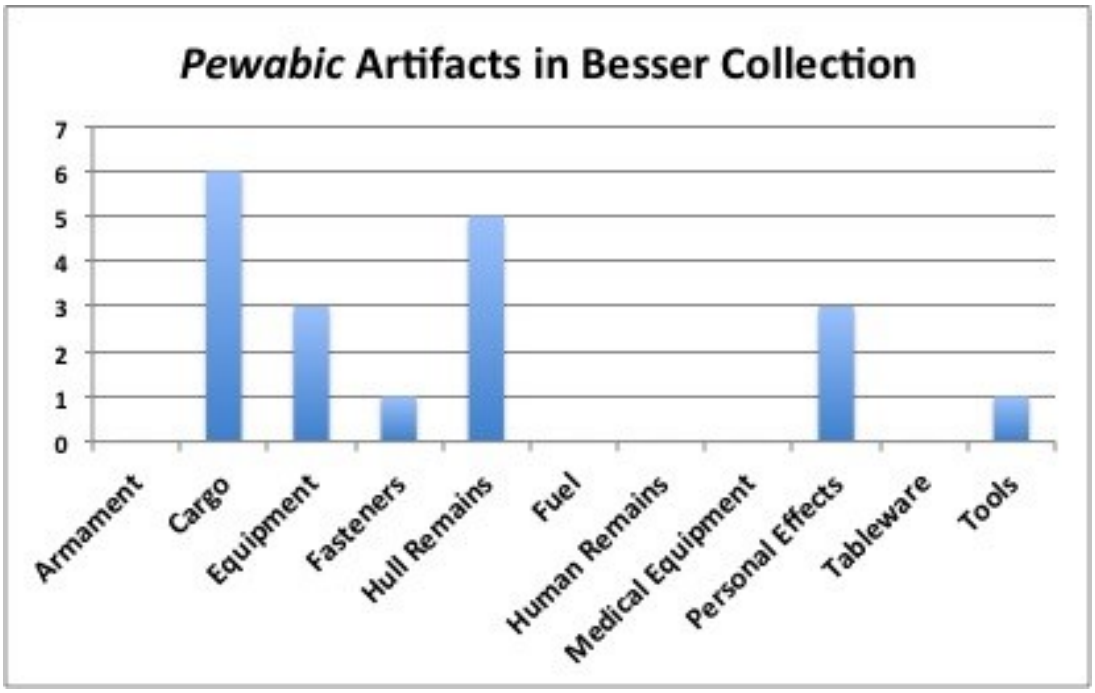


FIGURE 46. *Pewabic* artifacts owned by the Besser Museum. (Figure by Author, 2013.)

Besser Collection: Cargo

The cargo category is comprised of five twenty-pound ingots from the Franklin and Quincy Mines and one group of iron ore that is currently serving as landscaping décor outside the museum entrance (Figure 46). Pieces of clothing, a wool cloth swatch, match safe, thimbles, and pieces of ship make up the rest of the Besser collection. The cracked glass window that killed two men in the Smith Diving Bell and one of *Pewabic*'s 2,345-pound bow anchors are also on display (Figure 47). The anchor was donated by Busch and now rests on a concrete slab adjacent to the parking lot. The anchor has tipped spade flukes, rounded crown, and a wood-over stock that is 13'6" (Lusardi 2003:2).

It has not undergone state-recommended conservation and its condition is worsening by the year (Lusardi 2003:1).

FIGURE 47. Part of *Pewabic*'s iron ore cargo lies loose in a landscaping feature outside Besser Museum's front entrance. (Photo by Author, 2013.)

FIGURE 48. *Pewabic*'s anchor outside Besser Museum; note the discoloration on the stock from repeated saturation and thawing. The iron ore and anchor chain are not tethered to the foundation. (Photo by Author, 2013.)

Besser Collection: Personal Effects

Thimbles, a match safe, and three articles of clothing comprise the personal effects category of Besser Museum's *Pewabic* collection. The thimbles likely belonged to a first class passenger (Figure 48). They have similar circumferential designs and were likely built by the same maker. The slight difference in opening circumference suggests that the two thimbles were worn on one hand simultaneously, likely on the pinkie and ring finger. Knitting and sewing were probably activities enjoyed by female first class passengers between meals and social events.

FIGURE 49. Two thimbles in side-by-side comparison. (Photo by Author, 2013.)

The brass match safe is another artifact suggestive of passenger activities. Its aesthetic appeal suggests it was in public view, likely an accessory in the main dining hall or men's saloon. The matches it carried may have been used to enflame table candles in the dining hall, or to light cigars for an after-dinner delicacy.

Either of these conjectural uses is possible. The match safe is easily portable, and may have served both of these functions. On a basic level of interpretation, the shear presence of a tool designed solely to carry matches indicates a high level of luxury present in the first class domain (Figure 49).

FIGURE 50. Match safe, 79.34.20 was donated to Besser Museum in 1979. (Photo by Author, 2013.)

All three of the clothing samples are small unidentifiable fragments of fabric. Two silk pieces are thought to be remnants of ladies dresses, while a larger wool swatch has been proposed to be part of a Confederate uniform. With the material evidence available, it is highly unlikely that the gray wool square is of Confederate origin. Needless to say, amateur historians and reporters have tried to connect the piece of fabric with the 5 pound round shot in attempts to hypothesize a Confederate involvement in *Pewabic*'s fatal collision with *Meteor*.

Together, the State and Besser Museum collections only comprise a small percentage of

Pewabic artifacts. While it is impossible to know for sure, there are likely thousands more artifacts in private collections. Gregory Busch received "thousands" of collector inquiries about *Pewabic* material after his 1974 salvage but little interest from museums (Busch 1975:95). Further, most of the hull fragments raised by clam buckets were unloaded at the Alpena dock and sold, or gifted to local residents.

Artifact Reuse

Many of the hull fragments were recycled into folk art and architectural accents. Local residents found aesthetic, functional, and sentimental uses for *Pewabic* material. The bar surface in a Rogers City watering hole was constructed out of *Pewabic* timbers (Lusardi 2012, pers. comm.)(Figure 50).

FIGURE 51. *Pewabic* timbers that were salvaged from a fire in a Rogers City bar. (Photo by Wayne Lusardi, 2010.)

This example demonstrates the ability for shipwreck timbers to be used for both

functional and sentimental reuse. The small lakeside towns of the nineteenth century revolved around the water. Families were economically, culturally, physically, and socially connected to the inland seas. Shipwreck artifacts have become an outlet for locals to honor those who have served on the lakes, or to celebrate its power and role as provider.

Lamp, 20UH002.06.05.06, is an artifact that demonstrates reuse and the preservation of memory (Figure 51). Although the lamp is far from an original piece off *Pewabic*, it is referred here as an artifact because its base material is authentic and it has been issued an artifact number.

FIGURE 52. Lamp, 20UH002.06.05.06. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

The plaque reads: “STEAMER PEWABIC : Sunk in Lake Huron August 9, 1865 With

The Loss of 125 Lives And Still Rests On The Bottom". The lamp was donated by an Alpena resident as part of the fifth accession in 2006. The plaque's diction clearly emphasizes *Pewabic*'s identity as a grave. Although there is a list of thirty three persons known to have died, local news dramatized the event; many news reports claimed as many as one hundred and twenty five people were lost (*Eerie Daily Dispatch* 1865a; *Cleveland Plain Dealer* 1865; *Iosco County Gazette* 1897). The outrageously high losses of life reported in these articles were journalist tactics to sensationalize the event.

The plaque further dramatizes the boat, "And Still Rests On The Bottom" (Figure 52).

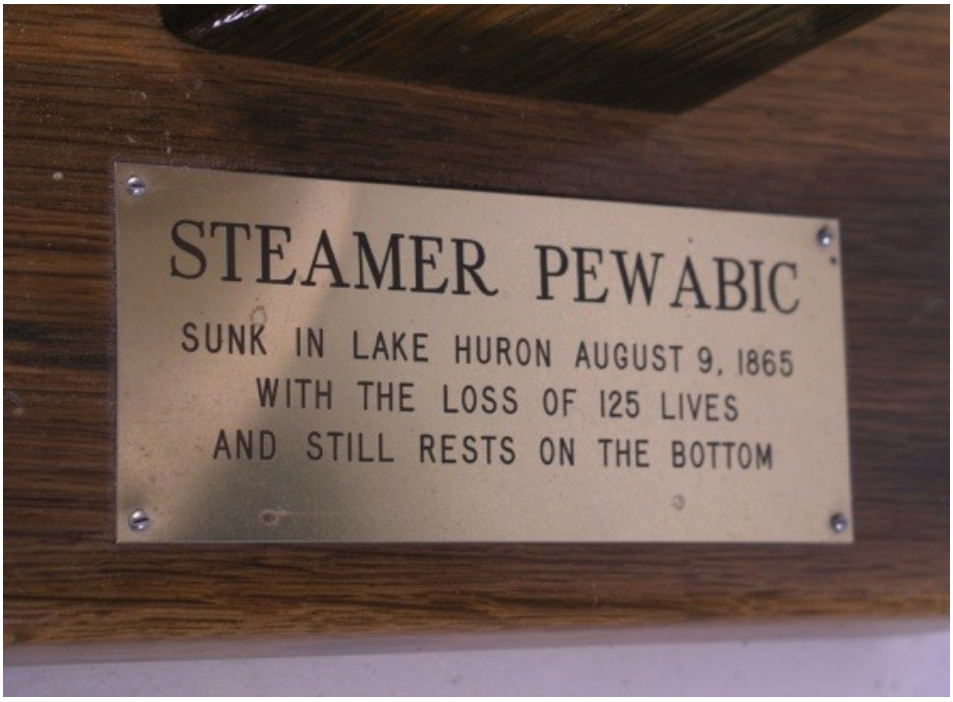


FIGURE 53. Dedication on lamp's base. (Photo by Author, 2013.)

This concluding line plays on the metaphor that *Pewabic* remains a source of death and despair. It also increases the sentimental and material value of the lamp: 'this piece of wood was from a shipwreck that killed one hundred and twenty five and still is in the lake'. It has a clarifying drift bolt and bolt hole to retain its physical association to the shipwreck, despite the heavy

modification from the original *Pewabic* timber. While the lamp is void of archaeological significance, the artist's intentions are noteworthy. The lamp reflects *Pewabic*'s place in Michigan history. The shape is the outline of Michigan's Lower Peninsula, and visually connects the piece of ship to the state of Michigan.

Besser 68.28.1 is another *Pewabic* ship fragment that has been crafted into a dedicatory art piece (Figure 55). According to Besser's records the piece is the engine room threshold board salvaged during the 1917 Leavitt expedition (Besser Museum for Northeast Michigan 2013). On the back of the piece is a steel wire wrapped around two copper anchors and the orientation of the small plaque suggest that this piece was hung vertically. The plaque, nails, and letter engravings spelling L-XX-S are three primary features on the intended display side of the piece.

FIGURE 54. Note the dedication illustration, and engraving of letter "I" to the right of it. (Photo by Author, 2013.)

On the plaque is a rendition of *Pewabic* with an unknown barquentine astern. The artist could have included the sailing vessel to emphasize *Pewabic*'s avant-garde reputation. Beneath the illustration is a brief summary of *Pewabic*'s career and emphasize the drama of its sinking. It is unclear whether the L-XX-S beneath the plaque was engraved by the artist post salvage, or by a shipbuilder during its construction. If the artist did the engravings, it is improbable that the letters correspond to a date, or anniversary; L-XX is seventy in roman numerals, and the 1917

salvage was executed fifty-two years after *Pewabic* sunk. If the letters do correspond to a manufacture date, the piece was then crafted in 1935, but the 'S' remains a mystery.

The size and wear of the engraving holes of L-XX-S are similar to the two rows of holes (sixty in total) on the non-display side of the piece suggesting that they were made together. The non-display side is flat and smooth and was probably secured to another piece of wood by small trim nails.

Other examples of *Pewabic* artifact reuse are two carved walking canes that are part of the state collection (Figure 54). The first cane has engravings that run from the middle of the shaft towards the handle (Figure 55).

FIGURE 56. Cane, 20UH002.09.11.01 measures 35" x 4.5" with engravings around the shaft. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

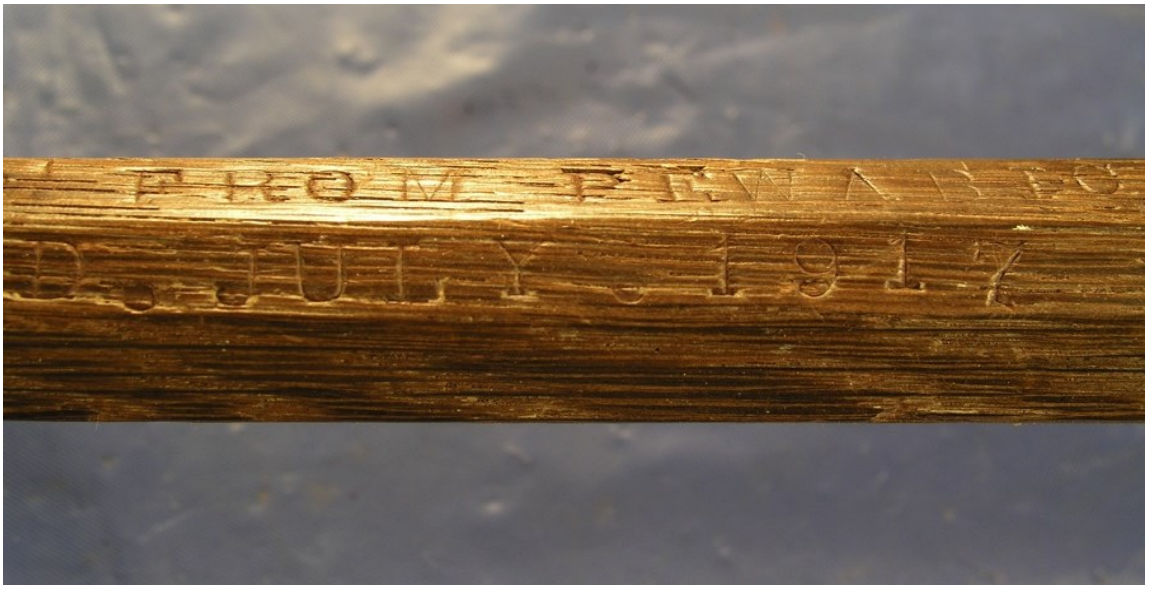


FIGURE 55.Part of the dedication. (Courtesy of the Michigan Office for Maritime Archaeology, Alpena, MI.)

On one side, “Wood & Copper From Pewabic Wrecked August 9 1865 Salvaged July 1917”; on the other, “Presented To The Muser Hamilton, Ont. From CB Gilbert, Alpena, Mich”.

According to news articles printed around the times of the salvage expeditions, canes were a common future for hull remains (*Detroit Free Press* 1909; Walker 1955; *Alpena News* 1974). The canes were made for individuals who had economic or sentimental interest in *Pewabic*. One cane was carved for the person initially deemed responsible for the tragedy: “A cane made from the wood and copper salvaged July 17, 1917, from the Pewabic was presented to Captain George P. McKay of Cleveland in 1918 by S.S. Moffat, collector of customs, Alpena” (*Alpena News* 1974).

The first cane on display presented to the “Muser Hamilton, Ontario” could be a gift crafted in the memory of one of the fourteen Canadian passengers known to be lost, or it could be a diplomatic gift, similar to a city key (*Goderich Signal* 1865).

The second cane, 20UH002.09.11.01, was donated by Nancy Stachnik, of Clinton Township, a Detroit suburb. Similar to the first, this cane has engravings along the shaft. On one side, “From Mary To Her Pa, Charles Anderson Xmas 1918”; on the other: “Wrecked Aug 9 1865 Salvaged July 1917 Pewaubic Wood & Copper 1865” (Michigan Office for Maritime Archaeology 2013). There is no public record of Charles Anderson, except in one newspaper article: “Mrs. Earl Fraser reports the cane was given to her by her late mother, Mrs. David Harrison who had secured it from her father, the late Charles Anderson. The relic of the Lake Huron tragedy is a treasured item at the Fraser home” (*Alpena News* 1965).

While the canes are physically similar, the engravings are different in one respect: the intended recipients have different relationships with the presenter. On the first cane, the wording is more formal (“Presented to…”) and mentions the locations of both the recipient and the giver.

This difference implies that the two have a physically distant, and probable professional relationship. The second cane, on the other hand, is clearly a Christmas gift from a daughter to her father or grandfather. Mary, in this case, is giving the cane to her "Pa" and uses the abbreviation "Xmas" as the occasion for the gift. The engraving analysis illustrates how *Pewabic*'s legacy has permeated different levels of social memory. It has been used to connect the daughter and father as well as distant relationships.

Canes are common destinations for pieces of ship. For example, the Vancouver Maritime Museum possesses six canes crafted from SS *Beaver* hull remains (Vancouver Maritime Museum 2013). Just as *Pewabic* and *Beaver* were facilitators of transportation, so too are the walking canes crafted from their remains. Whether used as aids to locomotion, or commemoratively displayed, the canes have helped infuse and prolong the stories of these early steam vessels into social memory. The walking canes exemplify *Pewabic*'s artifacts as "a medium of communication and expression" (Beaudry et al. 1991:152).

Chessboard, 20UH002.07.14.01, is another example of *Pewabic* kitsch that has connected relationships (Figure 56). On the back of the chessboard are two inscriptions. On the upper right corner reads "Present to Mr. Chas Dust - Made By Mr J.B. Chase – Feb 5th 1903". The inscription on the opposite corner reads "1,358 Inlayed Pieces Of Black Walnut And Maple From Cabin Of The 'Pewabic' Which Sank Of 'Thunder Bay' Near 'Alpena' 1865". The inscriptions indicate the chessboard was probably gifted to a professional contact of Mr. J.B. Chase in three ways. First, the word choice of the dedication and geographical clarification of the wreck suggests the recipient is not local. Similar to the language on the engraved cane, the dedication inscription uses the verb "present" which denotes the chessboard was likely gifted, or sold in a professional environment. Furthermore, the impressive craftsmanship suggests J.B.

Chase was a veteran woodworker who valued *Pewabic* material as an art medium. Not only did the chessboard manifest *Pewabic*'s story into the lives of Chase and Dust but, if true, is the only surviving wood specimen of *Pewabic*'s cabin.

FIGURE 57. Chessboard, 20UH002.07.14.01. (Photo by Author, 2013.)

The *Pewabic* artifact assemblage exemplifies material culture's ability to color and personalize the tragedy to both researchers and the public. Despite the fact that all of the existing artifacts are result of salvage efforts and some have been modified, they remain an important link to the vessel's history and characterize its climate on board. Its artifacts have reinforced the legend by offering a material connection to a tragedy that continues to excite the emotions of the

small lakeside community. Personal effects and passenger artifacts, like the champagne bottle and match safe confirm the jovial conditions on board the vessel before the collision and copper artifacts allude to *Pewabic*'s role as economic facilitator of the Keweenaw Peninsula.

It is without question that the artifacts would yield much more information if recovered in archaeological context, but their interpretation is still worthy of study because the artifacts shed light on *Pewabic*'s social importance to the Alpena community. Hundreds of shipwrecks lay in and around Thunder Bay, yet *Pewabic* is the most well-known, largely due to the artifacts inadvertently raised by salvers. With the exception of the middle twentieth century, salvage expeditions to *Pewabic* occurred on regular intervals which kept the shipwreck active in the public sphere. The ensuing spread of hull remains and passenger effects also spread the vessel's story. By 1974 *Pewabic* artifacts were highly collectable in any form, whether crafted into shipwreck kitsch, or not. While no archaeological provenience exists for any of the pieces, the surviving artifacts do speak to the community's sympathetic and honorary sentiments for the shipwreck which is valuable in studying its prominent place in local legend.

CONCLUSION

This thesis demonstrates the economic and social versatility of wooden passenger/package freight propellers in nineteenth century Great Lakes history. Unlike most Great Lakes vernacular craft, passenger/package freight propellers were designed to facilitate both package freight and passenger travel industries. Their capacity to handle these diverse trades was made possible by specific structural features that are unique to the class. These ships stretched the limits of wooden ship construction, and required substantial stem-to-stern longitudinal arches and internal support to prevent hogging or sagging.

Due to the presence of passenger cabins on the hurricane deck, these vessels were outfitted with gangways along the sides of the vessel that directed cargo loading procedures, which was executed by hand. Consequently the limits of hand-loading bound passenger/package freight propellers to the package freight industry. While other contemporary vernacular craft focused on one industry, passenger/package freight propellers carried anything that could fit through the gangways.

Consequently passenger/package freight propellers carried the greatest variety of goods per voyage of all boats on the lake. Freight contracts were arranged with both small and large producers. Due to their variety of cargoes, these vessels traveled to a variety of places. The ten-day itinerary for Lake Superior-bound vessels leaving Cleveland or Detroit was determined by where package freight needed to be picked up or unloaded. But, as their name implies, package freight comprised only half of its cargo.

On the hurricane deck, hundreds of America's middle class jumped on board for the ride. In these mobile hotels, the first class passengers participated in off-piste behavior only acceptable on vacation: flirting, dancing, and drinking. Passenger/package freight propellers' lush upstairs accommodations attracted the emergent middle class to renew, rejuvenate, and loosen their ties. For first class passengers, life on board passenger/package freight propellers was about the journey, not necessarily the destination.

Beneath the hurricane deck lay the steerage passengers, sprawled across boxes and barrels who only prayed to reach their final destination faster. These passengers were almost always blue collar workers or immigrants who paid their way by the mile. Steerage existence was much different than life upstairs, but passenger/package freight propellers' discounted steerage rates and frequency of stops often made them the only option for blue collar workers traveling in one direction.

Pewabic exemplifies and reflects the incredible versatility of these wooden tramps. While *Pewabic* is exemplary of the vernacular class, it was built with important structural innovations. It is one of the earliest wooden twin-screw propellers that has remained intact on the lake bottom. Twin-screw application to wooden hulls was a controversial vessel design because of the inherent problems of offsetting propeller machinery from the strong keelson assembly. Eliju Peck improvised twin stuffing boxes that housed the shafts at the aft apertures and kept them well-greased to reduce friction and vibration.

Pewabic was also fitted with a rare centerline arch that provided stem-to-stern rigidity to prevent the wooden hull from hogging or sagging. Nearly all wooden passenger/package freight propellers had twin side arches that served the same purpose. Pewabic is only one of few whose

wreckage yields important information about this rare configuration, and the only example with a near-complete arch.

The development of these structural elements emphasizes the important role that passenger/package freight propellers played in the development of Keweenaw Peninsula in the middle nineteenth century. Its capacity to carry different cargoes and passengers made it an efficient and ideal choice for mining company agents and settlers alike. *Pewabic*'s capacity to facilitate both passenger and package freight needs inevitable caused the two industries to develop simultaneously in the Lake Superior region. Both metal and man boarded *Pewabic* for Copper Country. Antebellum passengers were primarily immigrant workers who gave way to excursionist passengers after the Civil War. Both passenger groups, however, either had economic ties to the copper industry, or ventured north to see it.

Pewabic's variant cargo emphasizes the vessel's importance to the remote communities on the Keweenaw Peninsula. Large and small producers relied on *Pewabic* to deliver product to market, and return with supplies. Its biggest cargo, however, was also the most valuable. The 250 tons of native copper brought diving suit inventors to Alpena, Michigan within weeks of *Pewabic*'s tragic collision with *Meteor*. Revolutionary diving equipment was designed specifically for the *Pewabic* salvage, but not every attempt was successful. The copper's value and resulting publicity if inventions were successful made *Pewabic* a great lakes salvage training ground.

This thesis has demonstrated the connections between the Keweenaw Peninsula copper and passenger industries and the vital role that passenger/package freight propellers played in the development of the Keweenaw region. This analysis was achieved only through thorough

historical research into *Pewabic*'s different identities, and archaeological investigation of its wreck site that yielded important information on its construction that made the vessel capable of facilitating a wide range of cargoes and passengers.

As time passed, *Pewabic*'s local identity evolved from salvage target with solely monetary value to a shipwreck with infinite cultural value. Material remains of *Pewabic*'s hull, passenger effects, and other cargo increased the vessel's cultural value as time passed. Local residents reused its artifacts to immortalize *Pewabic* in local lore via shipwreck kitsch. While the artifacts would yield more information if recovered in an archaeological setting, they do illuminate how local perception of the vessel has changed.

The passing of Michigan legislation in the 1950s and 1960s and the Abandoned Shipwreck Act in 1987 have secured the vessel's protection under state law. Most recently, the Thunder Bay National Marine Sanctuary has taken *Pewabic*'s story to new levels in the Great Lakes Maritime Heritage Center. The Sanctuary has further immortalized *Pewabic* through exhibits, artifacts on display, and educational interpretation. It is safe to say that these initiatives will protect *Pewabic* from future salvage operations. Just as important, however, is *Pewabic*'s continued use by cultural resource managers to increase interest in maritime heritage in the local community.

Like many shipwrecks, *Pewabic* can yield an incredible depth of interpretation, and only through the detailed investigation of each of its components has the larger picture been attained. Though it is only one vessel, the information gleaned from *Pewabic* is impressive, from the history of the Keweenaw to deep-water marine salvage. The wrecking event prompted reactions from early marine salvagers as *Pewabic* was valued solely as a salvage target. As time passed

local focus was directed toward *Pewabic*'s value to the region's maritime heritage. Through the surfacing and dispersal of material culture, presence of tributary shipwreck kitsch, and education and research efforts by recent cultural resource managers, *Pewabic*'s transformation in value to the community is clear.

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